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ELEMENTS
OF THE
PRACTICE OF MEDICINE.

BY
RICHARD BRIGHT, M.D.
AND
THOMAS ADDISON, M.D.

PHYSICIANS TO GUY'S HOSPITAL,
AND LECTURERS ON THE PRACTICE OF MEDICINE.

VOL. I.

LONDON:
LONGMAN, ORME, BROWN, GREEN, AND LONGMANS,
PATERNOSTER-ROW.

1839.

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PREFACE.

THE Authors of the present publication, while engaged in their duties as teachers of the Practice of Medicine, have frequently felt the want of a work at once elementary and practical to which they might refer their pupils as a companion and assistant during the period of their studies. It is with a view of supplying to themselves such a book of reference that they undertake to add another to the many elementary works which are already before the public. The plan which they have adopted in the performance of this task, is to endeavour to state, with as much conciseness as is consistent with perspicuity, the history, symptoms, and treatment of each disease as established in their own minds by what they have read as well as what they have seen, introducing so much theory only as is indispensable to render the various subjects intelligible to the student, without entering at large

upon controversial points, or pretending to bring forward novel views or striking doctrines ; and thus disclaiming everything like the assumption of originality, they have not thought it necessary to burden their work, or perplex their pupils, by numerous quotations and an elaborate reference to authorities.

The necessary reference to the literature of their profession they consider to have been sufficiently and admirably performed by those who have preceded them in the same field ; but they have found in this very richness of illustration a source of embarrassment and distraction to the student which they hope to remove from the purely elementary matter collected in the present work.

How far their labours may be useful to any but their own pupils, the Authors are unable to say ; but trusting that they shall advance nothing but sound doctrines and wholesome practice, such as the majority of the enlightened members of the profession may recognise as rational and judicious, they will hope that their elementary work may not be unacceptable to others.

INTRODUCTION.

IN offering a second part of their work to the public, the Authors feel it incumbent upon them to apologise for having in some degree deviated from their expressed intention of avoiding the introduction of theoretical discussions ; but it has been found almost impossible to adhere rigidly to this determination, more particularly when treating on the subject of inflammation.

It may likewise be thought by some of their readers, that the observations they have made on the stethoscopic signs in the diseases of the chest, to which the present part is chiefly devoted, have been less explicit than might be expected in a purely elementary work ; but the Authors have judged it better, that the student should make himself master of the minutiae and the technicalities of this most important branch of medical acquirement,

by practice at the bed-side, and by the perusal of some of the many excellent and elaborate works in which it has been fully illustrated; while at the same time they hope that in the present fasciculus no essential stethoscopic indication has been omitted.

PREFACE TO PART III.

HAVING brought the present fasciculus to a conclusion, the authors have completed the first volume of their elementary work. The delay which has taken place is only such as will be easily accounted for, and freely excused by all who are actively employed in the practice of a laborious profession requiring constant personal exertion. The authors trust that the present Part will be found to have lost none of the practical character which they have endeavoured to infuse into the former portions of the work; and as this volume includes the whole which they think it necessary to say on the subject of Fever and the Phlegmasiæ, it may be considered as forming in itself nearly a complete work; in which reference has been made as seldom as possible to the subjects which will be successively treated in the remaining volume.

ELEMENTS
OF
THE PRACTICE
OF
MEDICINE.

FEVER.

WHEN a person is affected with chilliness or shivering, succeeded by a hot skin, a frequent pulse, general functional disturbance, and a feeling of languor and weakness, that person is said to labour under pyrexia, or a febrile state.

Such a pyrexia or febrile state is common to a great number of disorders, which are on that account designated febrile disorders.

In certain of these febrile disorders no local disease, no particular affection of any part of the body has yet been ascertained to be necessarily present. These are, by common consent, called 'Febres' or Fevers, subdivided into Intermittent, Remittent, and Continued Fevers.

In other febrile disorders, the pyrexia or febrile state is so uniformly found connected with some local affection, that the local affection and the febrile state are looked upon in the relation of cause and effect, as is exemplified in the febrile state resulting from injuries and inflammations.

Febres or fevers, therefore, as being independent of any necessary local affection, are said to be idiopathic or primary, whilst the febrile state connected with local disease is said to be secondary, sympathetic, or symptomatic.

The term 'fever' is indeed often made use of to express indiscriminately the diseases properly called 'fevers', and the pyrexia or febrile state which is common to or characteristic of all febrile disorders; but this is an abuse of language and leads to much confusion. In strict propriety, the term 'fever' should be applied exclusively to the diseases properly so called; whilst, instead of speaking of secondary or symptomatic fever, as is commonly done, we should convey our meaning more correctly, if we made use of the expression, secondary or symptomatic pyrexia, or, a secondary or symptomatic febrile state.

IDIOPATHIC FEVER.

When dividing Idiopathic fevers into the Intermittent, Remitting and Continued, Dr. Cullen subdivided the latter or Continued into three distinct species—Synocha, Synochus, and Typhus, a subdivision that has created much ambiguity in treating the subject of idiopathic fever; for whilst the two latter, synochus and typhus, are mere varieties of the same fever, the synocha or inflammatory fever, as it is usually called, is of extremely rare occurrence unconnected with some local inflammation or catarrhal affection, and may on that account, with great propriety, be treated of under the respective heads of Inflammation and Catarrh.

What follows, therefore, on the subject of idiopathic fever will be to the entire exclusion of synocha or inflammatory fever, and applicable only to intermittents, remittents, and that form of continued fever which has been called

synochus, typhus, and a variety of other names, but which for the present, it will be sufficient to designate, the common continued fever of this climate.

The most common symptoms of idiopathic fevers are, a hot skin, usually preceded by a sense of chilliness, or by actual coldness; a frequent pulse; a feeling of languor and weariness, often accompanied by an uneasiness which seems to pervade every part of the body; pain, giddiness, or confusion in the head, with diminished powers of memory and reflection; pain in the back and limbs; an impaired or depraved condition of the senses of taste, touch, smell, and hearing; loss of appetite; thirst; a foul tongue; and some hurry or oppression of respiration.

But as the number as well as the degree of these, the most common symptoms, varies very much in different cases, it has been attempted to determine and establish some individual symptom or symptoms which might be regarded as essential to, or characteristic of, all idiopathic fevers. It was with this view that the celebrated Boerhaave collected together the whole of the symptoms that had been observed in idiopathic fevers, and having done so, proceeded to abstract from them, in succession, all such as had ever been found wanting. In this way he arrived at the conclusion, that there are three symptoms uniformly present in every fever, —chilliness, a frequent pulse, and increased heat; but that the frequent pulse was the only symptom which was present in every stage of the disorder, and consequently that the frequent pulse might be regarded as the one individual symptom essential to and characteristic of fever.

It is unquestionably true, that the three symptoms—chilliness, frequent pulse, and increase of heat, very constantly occur in every idiopathic fever; yet it is equally certain, that to the constancy of each of them there are exceptions.

The chilliness or coldness which is so considerable and so striking in that form of idiopathic fever which we call an intermittent, or ague, is often slight and sometimes altogether unobserved in idiopathic fever of the continued form : it is probable, however, that it is a much more constant symptom of idiopathic fever in all its forms than the mere representations of the sick would lead us to suppose, and especially the representations of those who are habitually much exposed to the vicissitudes of our own unsteady climate. Such persons so necessarily and so frequently experience a sense of chilliness, without any indisposition following, that they are very likely indeed to disregard or overlook it, when it proves the earliest symptom of a fever.

The increased heat has at all times attracted particular attention, as is sufficiently attested by the radical meaning or import of all the names employed to distinguish and designate the disease : thus, the Greek πυρετός and the term pyrexia are both derived from the root πῦρ, signifying 'fire', whilst our own familiar word 'fever' has its origin in the Latin *ferveo*, to grow hot. In this matter, the origin of the names applied to 'fever' in all ages, corresponds with popular belief and popular language at the present day ; any increase of the heat of the body which cannot be ascribed to an obvious cause, being, by people in general, familiarly and simply expressed by the term 'fever.'

Increased heat, undoubtedly constitutes the most striking as well as the most characteristic feature of a fever ; whilst, it is highly improbable that any case of idiopathic fever ever passed through its entire course without manifesting it in a greater or less degree ; nevertheless, at the commencement of some severe forms of continued fever, it is hardly to be remarked for perhaps several days, whilst in the progress of similar fevers, the heat of the body not

very unfrequently falls even below the natural standard of health.

The frequent pulse, although the single individual symptom fixed upon as essential to and characteristic of fever, and although it be, without dispute, more constantly present in every stage and period of the disease than any other, is not by any means without its exceptions, for in the course of idiopathic fever of the continued form, it now and then happens that the pulse is not more frequent, and in some instances is even slower than natural.

Now, when the student is told that idiopathic fever is one of the most important and most frequent diseases to which the body is liable, and when he is told that it is one peculiarly remarkable for the number and variety of its symptoms, it is easy to imagine his surprise and perplexity on finding the character of the disease so vague and unsteady that only three symptoms can be fixed upon as more or less constant to indicate its presence, and that even each of these may in its turn be absent. His surprise and perplexity, however, will probably be considerably lessened, if he will keep steadily in view, the following positions, in regard to the nature of idiopathic fever.

In the first place, In every idiopathic fever, the causes producing it, inflict a morbid impression upon the nervous system, by which, the functions of that system, intellectual and bodily, are deranged, that derangement differing in degree in different cases.

Secondly, In every idiopathic fever, this morbid condition of the nervous system is associated with, or presently succeeded by, a deranged or excited state of the circulation; this derangement of the circulation differing in degree in different cases, and displaying a greater or less tendency to congestion or even inflammation of particular parts: and,

Thirdly, In the progress of every idiopathic fever, the secretions and excretions of the body become deficient, vitiated, or even irritating to the parts with which they come in contact.

Of course, every student of the theory and practice of physic, is supposed to be already acquainted with the anatomy and physiology, or in other words, acquainted with the structure and functions of the different systems and organs of the body : such knowledge, then, applied to the above positions, will, it is hoped, readily explain to him the cause of the infinite number and variety of symptoms met with in idiopathic fevers, whilst it will lessen his surprise at the inconstancy of each of these symptoms individually ; for, if each of the morbid changes comprehended in the above positions may occur in different degrees in different cases, he will have little difficulty in conceiving why the symptoms in any particular case should present a corresponding variety, and nevertheless be sufficiently indicative or characteristic of the disease called fever.

It is this endless variety of aspect assumed by idiopathic fever, from the circumstances just alluded to, that precludes the possibility of furnishing the student with what has been called a definition or short character of the disease ; there being no definition whatever, that will admit of universal application.

This being the case, it is customary to illustrate the general character and phænomena of idiopathic fevers, by portraying the symptoms and progressive changes observed to take place in one of them ; and as presenting these symptoms and progressive changes in their most distinct form and most regular order of succession, the paroxysm of an intermitting fever, or ague, is usually and very properly selected for the purpose.

On the approach of a paroxysm of an Intermitting fever, or Ague, the patient experiences a sense of lassitude, often accompanied with yawning and stretching, and gradually proceeding to an uneasy or irksome feeling, which seems to pervade every part of the body; he is weak and restless; his countenance appears dejected; his face is pale; his hands feel somewhat cold to the bystander, although probably he does not yet himself complain of any chilliness. In a short time, however, the blood seems scarcely to reach the surface of the body; the features appear contracted; the extreme parts of the body, as the ears, nose, fingers, and toes, assume a livid hue and shrink in size. The skin everywhere, but especially on the breast, arms, thighs, and legs, feels as if constricted, rendering the roots of the hairs distinctly prominent and thereby giving rise to what is called the *cutis anserina*, or goose-skin; the same change taking place in the skin of the scalp produces *horripilatio*, or a feeling as if the hair bristled up and stood erect.

The patient now begins to complain of general coldness and of frequent sudden chills, commencing about the nape of the neck, passing down the spine and extending to the extremities; each chill being attended with a shudder, which is repeated more and more frequently until it ends in a continual shivering, affecting all the muscles of voluntary motion, and producing chattering of the teeth.

After this state has continued for a longer or shorter period, the heat of the surface returns, although the patient may still for some time complain of feeling chilly; he soon however begins to experience transient flushes of heat, beginning in the face and neck, alternating with cold chills at first, but gradually extending and becoming more considerable, until the warmth is diffused over the whole body, and ultimately amounts to a dry burning heat, attended

with great restlessness, and not unfrequently with violent headache. With the return of heat, the skin resumes its natural colour, the shrunk parts their usual size, and when the heat is at its height, the surface appears even redder and more turgid than natural. A moisture at length breaks out on the head and neck, and by degrees on the trunk and extremities, becoming a general perspiration or sweat. In proportion as this flows universally and copiously the heat abates, and by the time the sweating terminates, the body has returned to its natural temperature, and the several functions that had been disturbed are restored to nearly the state in which they were before the paroxysm commenced.

The paroxysm of idiopathic fever above described naturally divides itself into three distinct stages,—a cold, a hot, and a sweating stage; whilst the symptoms attendant upon these respective stages afford a tolerable indication of the systems and organs more especially affected in each of them; as well as the order and succession in which such affection takes place. Thus, on the approach of the cold stage, we observe a manifest torpor or depression of the nervous system, which gradually increases as the cold stage advances. This torpor is observable in the diminished susceptibility of the organs of sense, by which impressions made upon them are much less vividly felt; it is also observable in the diminished powers of thought and recollection, amounting in some rare instances to almost an apoplectic stupor lasting throughout the whole of the cold stage.

The heart and arteries seem to participate largely in this general torpor, the pulse being at the commencement always weaker and sometimes even slower than natural. This weakness of the pulse increases with the cold stage,

and presently has superadded to it, a remarkable degree of frequency, and occasionally some irregularity. With this enfeebled condition of the circulation, we find a corresponding deficiency in the various secretions and excretions; the skin being dry and shrunk, the mouth clammy, and the urine scanty and watery. At this period too, we find the breathing short and anxious, and accompanied towards the termination of the cold and beginning of the hot stage, by a distressing sense of load or oppression at the præcordia. The appetite moreover, is entirely lost, occasionally with nausea or even vomiting; in short, every system, every organ, and every function seem now to be involved in the general torpor or depression.

With the return of warmth, there is a corresponding recovery of power in the nervous system, as shown in the revived susceptibility of the organs of sense,—the eye, the ear, the tongue, and the skin; and indeed at this period, the susceptibility of the eye and of the ear often returns in excess, so that the patient experiences more or less intolerance of light and noise; whilst a like excess of susceptibility now imparted to the brain not unfrequently gives rise to such hurry and confusion of thought, as to amount to actual delirium. We uniformly find associated with this return of power and energy of the brain and nervous system, a remarkable restoration of the circulation, the pulse becoming regular, distinct, full, and generally less frequent than during the cold stage; the respiration is now also more free, but continues to be somewhat anxious and hurried, until the sweating takes place, when the burning heat of skin gradually subsides, and with it the general restlessness and oppression of the breathing.

By steadily and attentively reflecting upon the symptoms and progressive changes just described as occurring in a

paroxysm of an intermitting fever or ague, it is hoped that the student can hardly fail to acquire a pretty accurate notion of idiopathic fever in general ; for, in all idiopathic fevers, he will find something analogous to the three stages so strongly marked in that of the intermitting kind. In remitting fever, for example, which is very closely allied to the intermitting, the first attack of the former very closely resembles that of the latter, and usually consists of a more or less distinct cold, hot, and sweating stage. After the first paroxysm, however, the general disturbance never entirely disappears—is never succeeded by a complete intermission, but merely undergoes a mitigation or remission as it is called, which remission, is again sooner or later followed by a fresh aggravation or exacerbation, more especially of those symptoms which characterize the hot and sweating stages ;—for, after the first paroxysm of a remitting fever, the subsequent paroxysms may or may not be preceded by a cold stage. A continued fever, on the other hand, may be regarded as consisting of one single but long-protracted paroxysm, the cold stage of the intermittent, being in this form of idiopathic fever, represented by the languor, lassitude, chilliness, blunted sensibility, and general feeling of debility and indisposition, which are variable in their duration, but which may last from one to several days, according to the particular circumstances of the individual case. The hot stage again, will be found represented by the general excitement which sooner or later succeeds to the previous period of depression. It is this hot stage, or stage of excitement, that constitutes, not only the most important, but the most striking and characteristic feature of a continued idiopathic fever. It usually persists with greater or less variation for one, two, or even three weeks. It is during the continuance of this hot

stage, or stage of excitement, too, that we observe so marked a tendency to local congestions and inflammations, and to a depraved condition of the several secretions and excretions of the body; and hence, it is this stage or period which imparts so varied a character to continued fever in general, according to the seat and degree of these congestions and inflammations, and according to the nature and degree of these vitiated secretions and excretions.

It is not often that this second stage or period of continued fever, can be said to be succeeded by a perfect sweating stage; for, although the disease does in some instances suddenly terminate on the breaking forth of a sweat, constituting what has been called a crisis, yet in ordinary cases, the only representative of the third or sweating stage found in continued fever, is, either the slow and gradual subsidence of the disorder, which constitutes convalescence, or that collapse or complete exhaustion of the vital powers which terminates in death.

DIVISION OF IDIOPATHIC FEVERS.

As already shown, idiopathic fevers have been divided into the *Intermitting*, *Remitting*, and *Continued*. By some, they have been divided, according to their supposed causes, into *Marsh* and *Contagious* fevers. By others, they have been divided, according to the kind or violence of particular symptoms, into *Gastric*, *Bilious*, *Nervous*, *Putrid*, and *Malignant* fevers. Idiopathic fevers have also been divided into *Endemic*, *Epidemic*, and *Sporadic*; *Endemic* fevers being such as prevail in particular climates or localities; the *Epidemic*, such as assail a great number of persons at the same time, from some cause not peculiar to the country or locality; the *Sporadic*, such as attack a certain few only, and appear to result rather from some ac-

eidental circumstance affecting the individual, than from any general cause.

PREDISPOSING CAUSES OF IDIOPATHIC FEVERS.

The predisposing, are usually considered to be such as merely promote or facilitate the operation of the exciting causes of idiopathic fever; whilst the exciting causes themselves are such as seldom fail to induce the disease in any person under almost any circumstances, provided they be applied in a sufficient degree or for a sufficient length of time. This division into predisposing and exciting causes is undoubtedly founded on correct observation, but is, nevertheless, by no means free from objection; some of the causes usually reputed to be predisposing, being now and then to all appearance capable of inducing actual fever, and especially so, when several of them happen to exert their influence at the same time.

Of the predisposing causes the following are the most common.

Age.—The middle period of life, or rather, that period extending from fifteen to thirty, appears to be that in which we most frequently meet with idiopathic fever. Persons of advanced life, although occasionally the subjects of intermitting and remitting, are comparatively little susceptible of continued fever, whilst very young children are rarely affected with the genuine form of either.

Original Constitution.—It may fairly be said of original constitution, that its influence is rather indirect than direct. It does not appear to be very influential of itself, or in a direct manner, and yet there is good reason for believing that it sometimes proves more or less favourable to the hurtful operation of other predisposing causes, and that it thus indirectly tends to the production of fever.

Beyond this, however, and the fact that certain indivi-

duals have, from causes that cannot be recognised, or in other words, from idiosyncrasy, manifested a peculiar susceptibility of some form of idiopathic fever, we are not at liberty, in the present state of our knowledge, to attach any great importance to original constitution as a predisposing cause of the idiopathic fevers of this climate, how much soever it may be supposed capable of modifying their character when once produced.

Epidemic Influence.—When a disease arises in a particular district or country, and attacks a great number of persons simultaneously, or at least in rapid succession, that disease is said to prevail epidemically, and is, under such circumstances, called an epidemic disease.

This sudden rise, and rapid dissemination of a disease, may be occasioned merely by the common predisposing and exciting causes happening to be called into more active operation at that particular period. When this is the case, its rise and rapid extension are thereby sufficiently and satisfactorily accounted for. In other instances, however, there is no evidence of the ordinary predisposing and exciting causes of the epidemic disorder prevailing with greater intensity than usual; which has led to the conclusion, that the surrounding atmosphere plays an important part,—that there exists, in short, in the atmosphere, some peculiar influence which renders individuals more susceptible of the common predisposing and exciting causes of certain diseases, even when these causes themselves do not or are not known to exist, in more than an ordinary degree.

This state of atmosphere, which, of itself, favours the rise and rapid extension of disease, was strongly insisted upon by the illustrious Sydenham, and was, perhaps somewhat fancifully, ascribed to “a certain secret and inexplicable alteration in the bowels of the earth.”

But, whatever may be its origin, with its real nature it must be confessed we remain altogether unacquainted, for it appears to be a state, which, for anything we yet know, is altogether independent of either the heat, the coldness, the dryness, the moisture, or the electric condition of the atmosphere, and such as cannot, therefore, be detected or appreciated either by the eudiometer or by any of our chemical tests.

The precise share which this latent and inscrutable state of atmosphere has in the production of epidemic diseases, independently of any other cooperating cause, it is difficult or impossible to ascertain; but whatever that influence may be, it has been supposed to vary very much in different instances. In Influenza or Epidemic Catarrh, for example, it is believed not only powerfully to predispose the community to the disease, but actually of itself to occasion it; whilst in Epidemic Small-pox, Measles, and Scarlet Fever, which are supposed to be produced solely and exclusively by their respective specific poisons, it is manifest it can only be regarded in the light of a predisposing cause.

With respect to Idiopathic fever, although it is undoubtedly true that both the intermitting, remitting, and continued forms of the disease occasionally prevail epidemically, yet there is reason to believe that they very rarely do so, without our being able to discover, at the time, an unusual degree of intensity in the causes which ordinarily lead to their production. Nevertheless it is extremely probable that there does occasionally exist a latent influence in the atmosphere, which if it do not favour the actual development of these disorders, very considerably and very uniformly modifies their general character when induced by other causes.

Other predisposing causes of Idiopathic fever may be said to be all such as have a tendency to impair or exhaust

the powers of the system;—such as, bad or deficient nutriment—residence in low or unwholesome situations, or in ill-ventilated apartments—the enervating influence of cold or of cold and damp—long privation of sleep—the exhaustion resulting from over exertion either of body or mind—the depressing passions, fear, grief, and anxiety—excess in venery, and the state of collapse succeeding to intoxication.

But, although the circumstances enumerated, for the most part merely promote the operation of the ordinary exciting causes of the disease, the student must again be reminded, that we often meet with Idiopathic fever of the continued kind, where the ordinary exciting cause cannot be proved to have existed at all, and where the disease would appear to have been produced solely by the operation of causes usually regarded as merely predisposing to the disease: whilst on the other hand it every now and then happens that even after exposure to the ordinary existing causes, the disease fails to be developed until the susceptibility of the system has been increased by the subsequent application of one or more of the predisposing causes.

EXCITING CAUSES OF IDIOPATHIC FEVER.

As already stated, the exciting causes of Idiopathic fever are such as seldom fail to induce the disease in any person to whom they happen to be applied in a sufficient degree, or for a sufficient length of time, how little soever that person may be predisposed to it at the period of their application. The principal of these, are, Marsh Miasmata and Contagion, the former giving rise to Intermittents and Remittents, the latter to Continued fever.

Marsh Miasmata.—The ordinary and perhaps the only exciting cause of the intermitting and remitting forms of Idiopathic fever, is a certain miasm or effluvium generated

during the putrefaction or decomposition of vegetable matter, and which, from its being most frequently observed to prevail in marshy grounds, has received the name of Marsh Miasm, or Marsh Effluvium. But as it may be generated in many other situations, provided vegetable decomposition be present, some have been induced to discard the term Marsh Effluvium, and have suggested as a substitute for it 'Malaria'. This term 'Malaria', however, appears to be far too general; for, in its literal acceptance, it merely signifies bad air, and is thereby calculated to confound the specific cause of Intermitting and Remitting fevers, with other impurities, which may happen to contaminate or impregnate the atmosphere. Always bearing in mind, therefore, that the miasm or effluvium here spoken of, may arise from vegetable putrefaction or vegetable decomposition under a variety of circumstances, it may be just as well, in what follows, to adhere to the old and familiar name of Marsh Miasmata, or simply Miasmata.

With the essential nature of marsh miasmata, we are altogether unacquainted; for they do not appear necessarily to possess any odour, neither do they affect the character or composition of the atmosphere in any way discoverable by eudiometric or chemical tests. Being ignorant, therefore, of their essential nature, we must be content in the present state of our knowledge, to investigate the circumstances which influence their production and their operation as a cause of disease.

The combination of circumstances most favourable, if not positively essential, to their production, is, that decay of vegetable substances which takes place under the united influence of a certain temperature and a moderate degree of moisture. This combined agency is most frequently found in marshes; and hence it is that these miasmata, and the forms of Idiopathic fever to which they give rise, are almost

uniformly observed to prevail to a greater or less extent in such situations.

Although a clayey soil or a rocky substratum, by retaining moisture, may indirectly favour their production, it is not yet satisfactorily determined whether certain soils are of themselves more productive of marsh miasmata than others; neither is it known whether the miasmata of one species of soil, differ from those of another, in any respect, but that of mere quantity or degree. It has however been supposed by some, that the decomposition of flax, hemp, rice, and coffee is more prolific of them than that of the ordinary vegetation of marshes; whilst, on the other hand, it is ascertained that the vegetable decomposition which leads to the formation of peat-moss, does not produce them at all.

Moisture plays so important a part in the production of miasmata, that some highly respectable authorities have attributed the morbid influence of marshes and swamps entirely to its agency. Such a conclusion however, is altogether at variance with well-ascertained facts; and it is now pretty generally admitted, that collections of water however large and extensive, do not give rise to Intermitting or Remitting fever, provided no part of the bed of the water be exposed to open day, and provided the surrounding country be completely free from marsh or swamp;—mere watery vapours possessing no such power.

The quantity of moisture most favourable to the evolution of miasmata, appears to be that which is just sufficient to soften or macerate the vegetable matter so as to promote its decomposition, without excluding the influence of the atmosphere; and hence it is, that either too little or too much water may equally tend to arrest the process: for, when the vegetable matter is perfectly dry, its decomposition

is slow, imperfect, and probably innocuous ;—when, on the other hand, there is so much water as completely to cover it, and thereby protect it from atmospheric influences, those changes essential to the generation of miasmata appear to be altogether prevented or put a stop to.

It is owing to this law, that a certain part or district shall be at one time healthy and at another time unhealthy, according to the quantity of rain that shall happen to fall ; for, if the quantity of rain be small, it may furnish just that degree of moisture which is necessary for the production of the miasmata ; whilst, if it be so considerable as to cover the same tract of country to some depth, the very reverse will, for the reasons assigned, be the result. It is upon this principle too, that very dry and very wet seasons equally tend to produce Intermitting and Remitting fevers in unusual situations ; the former by exhausting the water of lakes, rivers, ponds, and pools, so as to expose the mud at the bottom, which almost always contains a large proportion of decaying vegetable matter, to the influence of the sun and atmosphere ; the latter, by extending the necessary moisture to parts which are naturally so elevated, as to escape its application and lodgement to a sufficient degree in ordinary seasons.

That heat should favour the production of miasmata, is only in accordance with what we know of its power in favouring decomposition in general, and appears to be established by the fact, that they are found to prevail more extensively, as well as with greater intensity, in hot than in cold climates and seasons ; cold, according to its degree, manifestly retarding, or altogether suspending their development.

It is not to be forgotten, however, that the conclusion drawn from these facts, is not altogether free from fallacy,

in as much as there is at all times a greater profusion of vegetable matter falling into decay in hot than in cold climates and seasons. But, although it is difficult to determine exactly how much or how little a certain degree of heat may have to do with the generation of miasmata, and although the sun may possibly exert a decomposing influence independently of temperature, yet is it indisputable, that wheresoever we find the combination of decaying vegetable matter, moisture, and a powerful action of the sun's rays, there do we find the miasmata to exist with the greatest certainty and in their greatest intensity.

In the foregoing remarks, no notice whatever has been taken of the animal matters which are known to abound in marshes, or of the share which their decomposition may have in producing the noxious miasmata; neither has it been deemed necessary to direct the student's attention to the carburetted hydrogen gas which is ascertained to be formed and extricated during this process of vegetable decomposition. Experience renders it probable, that neither animal decomposition nor an admixture of carburetted hydrogen gas with the surrounding air, possesses the power of inducing Intermitting or Remitting fever. Tanners, cat-gut makers, and those engaged in the manufacture of sal ammoniac, are from the nature of their respective occupations almost constantly exposed to the effluvia arising from putrid animal matter, and nevertheless are not found to be more subject to Idiopathic fever of any kind than other people; whilst the same may be said of those, who, from being engaged in gas-works or in coal-mines, are repeatedly exposed for hours together to the influence of carburetted hydrogen gas.

Although marsh miasmata have been so called in consequence of their being most frequently observed to arise

from fresh- or salt-water marshes, it would be very erroneous to suppose that they are engendered in such marshes alone; for, ordinary vegetable decomposition in any situation, appears to be capable of producing them. Indeed, as more or less vegetable decay is necessarily going on at all times and in all places, it is probable that the atmosphere on land is never entirely free from miasmata, the absolute quantity varying according to the season of the year and other circumstances influencing their production. This supposition will go some way to explain the greater salubrity in general of sea than of land breezes; whilst, the various conditions pointed out as those which are essential or at least favourable to the evolution of miasmata, will prepare us to expect their presence and noxious influence, wheresoever vegetable decay is found in operation, whether the process take place in the neighbourhood of public wharfs, public markets, or in sewers, cesspools, holds of ships, stagnant waters, or in filthy and neglected streets.

The influence of miasmata commonly extends but a very short distance from the source of their development; neither can they, like contagion, be conveyed by clothes and other articles, usually called fomites, to a distance so as to produce disease. Their influence and distribution nevertheless, appear to be greatly modified by certain collateral circumstances. The wind, for example, may convey them to a distance more or less considerable in the direction in which it blows, and may thereby bring within their influence, persons who would otherwise remain perfectly secure, whilst those situated to windward may enjoy comparative immunity; and hence it is, that individuals exposed to the wind blowing over a marsh, or other source of miasmata, are at all times observed to suffer more than those who are not so exposed, or who, by the inter-

position of woods, mountains, or any other means, are protected from it, although the actual proximity may be the same in both instances.

The temperature of any prevailing wind will also have its influence, especially in mountainous situations, a warm or hot wind giving the miasmata a tendency to ascend, whilst a cold wind, on the contrary, will rather favour their descent. Dampness or moisture also appears to play an important part, not only as favouring vegetable decomposition, but as a medium of conveyance; for whatever may be the properties of miasmata in other respects, there is reason to believe, that they are soluble, or at least suspensible, in watery vapours. It is this solution or suspension in watery vapours that has been held to account for the usually greater insalubrity of low than of elevated situations, and for the peculiarly pernicious influence of night air; it being supposed that the moisture raised by the heat of day, becomes condensed by the cold of evening, descends, and carries down with it the miasmata which had been dissolved or suspended in it. It is probable also that from this cause, miasmata may occasionally be carried to a distance by fogs or clouds, according to the force and direction of the wind.

The effects of miasmata on the human subject will vary with the intensity of the miasmata and with the susceptibility or idiosyncrasy of the individual. It has already been suggested as probable, that miasmata prevail in a greater or less degree on land at all times, owing to the vegetable decomposition which is everywhere in operation. They may not perhaps be developed of such intensity as to give rise to any of the ordinary forms of fever, and may nevertheless prove sufficiently deleterious to influence the general health. We occasionally see this insidious effect of miasmata

strongly indicated by the sallow complexion and general derangement of the constitution of those who reside in marshy districts, but who have never experienced an actual attack of fever. It is this insidious operation of miasmata too, that has been supposed by some to give rise to a great many disorders taking on more or less of an intermitting character; whilst others, probably with greater justice, have rather regarded the miasmata as modifying such disorders when produced by their ordinary causes.

Of course, the most familiar result of exposure to miasmata is an attack of Intermitting or of Remitting fever, but the circumstances which determine the particular type of fever induced, are, it must be confessed, involved in considerable obscurity, it being difficult or impossible to ascertain how much in this respect depends upon the intensity of the miasmata, and how much upon the state of the individual. Exposure to marshy situations most frequently induces the Intermitting form of fever, Remittents occurring in the same situations, for the most part, only when the greater heat of the weather and other circumstances tend at once to add to the intensity of the miasmata, and to derange the system of those who are exposed to their influence. It is accordingly in autumn, when the miasmata are most rife, when the heat is considerable, and when the hepatic and other abdominal secretions are so liable to become vitiated and irritating, that Remitting fevers are found to be most prevalent and severe; not unfrequently having their remissions so masked as to take on a good deal of the continued or typhous form; and indeed when the miasmata arise from sewers, cesspools, stagnant waters, and suchlike sources; when a certain degree of offensive putridity is combined with them, not only do Remitting fevers take the place of the Inter-

mitting, but fever is occasionally produced of such malignity, that the remission becomes altogether obscured or obliterated, and the disease presents all the worst symptoms met with in the most aggravated forms of a Continued or Typhous fever arising from contagion.

The length of time that elapses between the application of the miasmata to the body and the development of their effects, or, in other words, the period of incubation, varies in different instances. It has been said that some have felt giddy, sick, and faint, almost immediately on being exposed to the miasmata, and have forthwith become the subjects of fever. An interval of one, two, or three weeks, is however by far the most common, although innumerable instances are on record of several weeks or even months having elapsed before fever showed itself.

As it regards the individual, it may be observed generally, that whatever tends to impair the powers of his constitution will increase his susceptibility, and will thereby favour the morbid operation of the miasmata. It has also been found that the unseasoned, or such as have never been exposed to the influence of the miasmata before, are very susceptible; whilst, on the other hand, those who have been exposed and have thence undergone an actual attack of fever, are even more so. Indeed, after one attack of Intermitting fever, especially if it have proved obstinate or severe, very slight causes will often suffice to reproduce it; and hence it is, that after an attack under such circumstances, or even after mere exposure to the miasmata and without any consequent attack of fever at all, the application of cold and damp to the body has been repeatedly observed to develop the disorder, thereby displaying the power of a direct or immediate exciting cause.

Contagion.—When in the progress of any disease a something is developed which is capable of producing a similar disease in another person to whom it is applied, the something so developed is called a contagion, and the disease itself is said to be a contagious disease.

The mode in which a contagion requires to be applied to another person so as to produce a disease similar to that which gave rise to it, differs in different cases. It is sometimes necessary that a contagion should be introduced by inoculation, or at least applied to a broken or wounded surface, as is the case with the contagion of hydrophobia. In other instances, the mere application of a contagion to the sound skin is sufficient, as is exemplified in the contagions of Syphilis, Scald-head, and Itch. In others, the contagion diffuses itself through the atmosphere and is applied to the body through that medium, as we find in Measles, Scarlet fever, Plague, and Continued fever. Lastly, a contagion may take effect when applied in more ways than one, as is the case with the contagion of Small-pox, which produces a similar disease in another person, whether applied by inoculation or through the medium of the atmosphere.

With regard to the essential nature of contagions, very little is known. If really material, some of them appear to exist only in the state of a vapour, or at least in a state of attenuation sufficient to be diffused through the atmosphere, and in such a manner that we are unable to detect or recognise their presence in any other way than by the effects produced by them upon persons brought within the sphere of their influence; for, although attempts have been made to ascertain the peculiarities of those contagious fluids which give rise to Small-pox, Hydrophobia,

Itch, and Scald-head, nothing at all satisfactory has resulted from them.

With the particular pathological conditions of the body necessary to the development of these respective contagions, we are altogether unacquainted ; but we know that whatever these conditions may be, they are produced differently in different instances. In Small-pox, Measles, and Scarlet fever, the pathological states necessary to the development of their respective contagions are, so far as we yet know, uniformly and exclusively produced by the application to the body of the specific contagions themselves, derived either directly or indirectly from persons already affected with the complaint ; whilst in regard to Plague, Continued fever, and some other contagious disorders, the pathological condition of the body upon which the formation or secretion of the contagion depends, may be produced not only by similar contagions derived from persons already labouring under the disorders, but may also be induced by other causes.

This is a curious fact in the history of contagions, and establishes a most important distinction amongst them. Under what combination of circumstances the contagions of Small-pox, Measles, and Scarlet fever were first formed, it is impossible to offer even a reasonable conjecture. They appear to have first arisen in particular regions of the world, and to have spread from thence to such parts only as held communication with them ; neither have these diseases ever been known to occur for the first time in any part, independently of such communication. It would therefore appear, that the contagions which give rise to Small-pox, Measles, and Scarlet fever at the present day, are exclusively and lineally the offspring of those originally or pri-

mitively introduced into the world ; and as the peculiar combination of circumstances which gave them birth may never occur again, it is possible that if they could once be extinguished, the diseases themselves might for ever disappear. This is very far, however, from being the case with the contagions of Hydrophobia, Itch, Scald-head, Plague, and Continued fever ; for although these diseases perhaps uniformly generate in their progress a specific contagion, they are diseases nevertheless which may be produced by other causes than contagion ; by causes which are probably at all times in operation in a greater or less degree :—and hence it is, that even supposing their contagions for the moment to become absolutely extinct, we never could hope to prevent the recurrence of the diseases themselves, so long as the operations of nature continue to be what they are at present. For the reasons just stated, it is said of the contagions of Hydrophobia, Itch, Scald-head, Plague, and Continued fever, that they can be generated *de novo*, which is not the case with the contagions of Small-pox, Measles, and Scarlet fever.

Contagion of Continued Fever.—By the contagion of Continued fever, is meant a something given off by the bodies of those already labouring under the disease, and which is capable of exciting a similar disease in another person.

With the real nature of this contagion we are altogether unacquainted, neither do we know the precise mode in which it is discharged from the bodies of the sick,—whether only some or whether all the secretions and excretions are more or less tainted with it. Like the miasmata which give rise to Intermitting and Remitting fevers, it appears at all times to exist in the state of vapour, contaminating the atmosphere ; like miasmata, it is only recogni-

sable by its effects; but, unlike miasmata, it may adhere to, and be conveyed to a distance by, fomites, so as to extend the disease to others.

Some respectable authorities, it must be confessed, have denied the existence of contagion in Continued fever, or in other words, have denied that it is a contagious disease. In support of that denial they have alleged that Continued fever occasionally prevails epidemically, and in particular places only; that Continued fever will make its appearance in parts remote from each other, leaving an intervening district free from the disease; that Continued fever has its rise, height, and decline; that it does not attack every individual exposed to its influence; and that it rarely extends to the attendants when the sick are removed to a wholesome situation.

All these objections, however, except the last, are just as applicable to diseases which are indisputably contagious, as to Continued fever; for precisely similar circumstances are observed to attend the rise and progress of Small-pox, Measles, and Scarlet fever.

But, although it is now admitted by most men of experience, that Continued fever is contagious, a belief is equally general, that, for the contagion to take effect, so as to excite the disease in another person, a certain cooperating condition is almost, if not quite, indispensable. That condition is, either a peculiar susceptibility on the part of the person exposed, or, deficient ventilation around the source of the contagion. By far the most frequent and most powerful cooperating condition, is unquestionably imperfect ventilation of the apartments of the sick, in consequence of which, the contagious effluvia are permitted to accumulate, and thereby to acquire such a degree of con-

centration or power, that in some instances, scarcely a single person escapes disease, who has the misfortune to be exposed to their influence.

It is not improbable that deficient ventilation may favour the operation of all contagions, but it is peculiarly the case with the contagion of Continued fever. Hence it is, that we so rarely find Continued fever to spread by contagion in well-ventilated apartments, or in the airy wards of a hospital, unless a great number affected with the disease happen to be collected together;—and hence it is, that Continued fever so seldom attacks the attendants when the sick are removed into a wholesome situation; whereas, in the ill-ventilated habitations of the poor, the contagion never fails to acquire an extraordinary degree of virulence, —such a degree of virulence, in general, that almost every inmate sooner or later sickens with the disorder.

It has already been observed, that Continued fever appears occasionally to be induced by causes usually regarded as merely predisposing to the complaint, such as cold, want, misery, and hardship, without any evidence whatever of the application of contagion. But besides this, experience has shown, that merely crowding together great numbers of even healthy persons, is now and then sufficient to engender something capable of exciting Continued fever, and especially so, when aided by bad ventilation, and inattention to cleanliness. Whether or not the matter so generated be identical with contagion remains to be proved.

Upon the whole, then, facts seem to authorize the conclusion, that a genuine Continued fever may be produced by various causes, but that when once produced, it is, in every instance, really and truly a contagious disease. The expression *genuine* Continued fever is here made use of, be-

cause it has not yet been satisfactorily ascertained whether those continued forms of Marsh or Miasmatic fevers, occasionally met with in this country, ever prove contagious.

Crisis and Critical Days.

It occasionally happens in Idiopathic fever, especially in severe cases of the Continued kind, that a sudden and unexpected change takes place, by which the condition of the patient is forthwith converted from one of perhaps imminent peril, to one of comparative security; every bad symptom undergoing a remarkable change for the better, the powers of the system immediately rallying, and the several organs and functions slowly but steadily returning to their usual healthy condition.

Such an event has been denominated a crisis, from the Greek word κρίσις, signifying judgement, and having reference to the fact, that the event itself generally enables the practitioner to judge of or prognosticate the result of the case in which it occurs.

As this crisis is commonly preceded or accompanied by some unusual evacuation, such as a sweat, a purging, or discharge of blood, the ancients, who were attentive observers, very naturally concluded that with the unusual or critical evacuation some poisonous or morbid matter that had produced the disease, was expelled from the body.

It was this view that led to the doctrine of concoction among the ancients. They imagined that fever arose from a poison either generated within the body, or introduced from without; that in order to assimilate this poison to the healthy fluids and thereby render it innocuous, or in order to fit it for expulsion by some of the emunctories, nature set up a sort of fermentative process in the blood, which they called concoction. It was supposed that this process

of concoction required, like fermentation, a certain period to be complete, and that the completion of the process, and consequently the critical discharge, took place on certain days in preference to others ; these days were accordingly called critical days. On the critical days the crisis was supposed to be most complete, and consequently most favourable ; whilst, the crisis that happened on any of the intervening days was looked upon as being less complete and therefore less favourable.

The critical days of Hippocrates were the 3rd, 5th, 7th, 9th, 11th, 14th, 17th, and 20th ; so that from the 3rd to the 11th day he supposed the tendency to a crisis to observe the tertian, and from the 11th to the 20th the quartan period.

It is impossible to deny, that both in health and disease, there exists a remarkable tendency in the human body to observe certain periodical revolutions : we see this tendency shown in health by the regular return of desire to eat, drink, sleep, and obey the calls of nature ; and, in disease, we find it still more strikingly illustrated by the regular return of the paroxysms of a quotidian, tertian, or quartan ague. It is also quite true, that some diseases, especially amongst the exanthemata, pursue so regular and uniform a course, that we can foretell, almost to a day, when and what changes will take place ; but as it regards Idiopathic fever, it must be confessed, that neither in its natural progress and continuance, nor in its tendency to a crisis on particular days, has any special uniformity been established, notwithstanding the evidence in the affirmative, of many respectable authorities, from Hippocrates downwards. Some have indeed attempted to account for the confidence of the ancients in this matter, and for the importance they attached to it, by observing, that their mode of living was

so much more simple, and their medical practice so extremely inert, that the natural and regular progress of the disease would be infinitely less likely to be interrupted or modified than at the present day. But admitting all this, it is impossible to go the length that Hippocrates and his followers have done in regard to crises and critical days: accordingly, it is for the most part only in the more severe forms of Idiopathic fever, and especially of the continued kind, that we ever observe a decided crisis to take place at all; and even then, apparently without regard to any particular day, beyond a tendency perhaps to what may be called a septenary period, as recognised in the common expression of a seven, fourteen, or one-and-twenty-day fever.

It has been already stated, that a crisis is commonly preceded or accompanied by some unusual discharge, which on that account has been called a critical discharge. Amongst the critical discharges, the ancients enumerated various abscesses and cutaneous eruptions; but those most commonly met with at the present day, are, a more or less considerable, but universal and equally diffused perspiration; a diarrhoea; a flow of urine, usually depositing a lateritious sediment; and a discharge of florid blood from the nose. We have also seen the crisis of Continued fever accompanied, in one instance, by a profuse evacuation of florid blood from the intestines, and in another, by a sudden and copious expectoration from the bronchial tubes.

Little in the way of explanation can be offered respecting the nature of a crisis. That it consists in an expulsion from the system of any *materies morbi*, as the ancients imagined, is altogether destitute of proof; whilst, in many cases of Idiopathic fever, we have no evidence whatever of the entrance of a morbid matter of any kind. This is the more

remarkable, in as much as it is chiefly in Continued fever that we observe a crisis to happen, and we know that Continued fever often arises from causes having no discernible connexion whatever with noxious or poisonous matter: whereas, in Intermitting fever, which does arise from a poisonous effluvium, we have what may be called a critical discharge of urine and sweat after each paroxysm, and nevertheless the disease continues.

It is probable, therefore, that the crisis and critical discharge depend, generally, upon a more or less sudden cessation or removal of that morbid impression which had been stamped upon the nervous system by the predisposing and exciting causes;—that upon this taking place, the several organs of the body experience a corresponding relief, and have their respective functions restored either in a natural degree or in excess, the excess constituting some of the forms of what are called critical discharges. This is probably the case with the critical discharges of sweat, stool, and urine, which may therefore be regarded rather as the effects than the causes of the favourable change; but in regard to the critical discharges of florid blood, we have good grounds for the conclusion, that in some instances, the discharge proves, to a greater or less extent, a cause of the favourable change that attends or succeeds to it.

INTERMITTING FEVER.

By an Intermitting fever, or Ague, is meant, an Idiopathic fever consisting of repeated paroxysms, which seldom occur oftener than once in twenty-four hours, and which have a perfect intermission or apyrexia between them.

On the approach of a paroxysm, the patient experiences a sense of lassitude, often accompanied with yawning and stretching, and gradually proceeding to an uneasy or irksome feeling which seems to pervade every part of the body; he is weak and restless, his countenance appears dejected, his face is pale, and his hands feel somewhat cold to the bystander, although probably he does not yet himself complain of any chilliness. In a short time, however, the blood seems scarcely to reach the surface; the features appear contracted; the extreme parts of the body, as the ears, nose, fingers, and toes, assume a livid hue and shrink in size; the skin everywhere, but especially on the breast, arms, thighs, and legs, feels as if constricted, rendering the roots of the hairs distinctly prominent, and thereby giving rise to what is called the cutis anserina, or goose-skin, and the same change taking place in the skin of the scalp, produces horripilatio, or a feeling as if the hair bristled up and stood erect. The patient now begins to complain of general coldness, and of frequent sudden chills, commencing about the nape of the neck, passing down the spine, and extending to the extremities, each chill being attended with a shudder, which is repeated more and more frequently until it ends in a continual shivering affecting all the muscles of voluntary motion, and producing chattering of the teeth. After this state has continued for a longer or shorter period, the

heat of the surface returns, although the patient may still for some time complain of feeling chilly: he soon, however, begins to experience transient flushes of heat, beginning in the face and neck, and alternating with cold chills at first, but gradually extending and becoming more considerable, until the warmth is diffused over the whole body, and ultimately amounts to a dry burning heat, attended with great restlessness, and not unfrequently with violent headache. With the return of heat, the skin resumes its natural colour, and the shrunk parts their usual size; and when the heat is at its height, the surface appears even redder and more turgid than natural. A moisture at length breaks out on the head and neck, and by degrees on the trunk and extremities, becoming a general perspiration or sweat. In proportion as this flows universally and copiously the heat abates, and by the time the sweating terminates the body has returned to its natural temperature, and the several functions that had been disturbed are restored to nearly the state in which they were before the paroxysm commenced.

The period of time that elapses between the commencement of one paroxysm and the commencement of another is denominated an *interval*; whilst, that, from the termination of one paroxysm to the commencement of another, constitutes what is called an *intermission*. It is from the length of the interval, that the different forms or types of Intermitting fever derive their names. When a paroxysm occurs every day, the disease is called a Quotidian; when a paroxysm takes place every other day, that is, every third day, the day of attack or recurrence being reckoned the first, the disease is said to be a Tertian; whereas, if there be only one paroxysm in seventy-two hours, that is, on every fourth day, it is called a Quartan.

Although these, the quotidian, tertian, and quartan types

are unquestionably by far the most common, several other varieties are nevertheless occasionally met with. In some instances, the interval has been longer, constituting Quintans, Sextans, Septimans, and so on. These, however, are comparatively rare, and when they do occur, are extremely liable to become changeable or erratic in their type, so as to lead to a suspicion that they are merely modifications or irregular developments of the more ordinary forms of the disease. Sometimes a person will have a paroxysm every day, as if affected with a quotidian, but with the paroxysms on the alternate or tertian days, corresponding with each other in their duration, character, or period of attack. Such a person is said to have a double tertian—*tertiana duplex*. In other instances the disease will recur only on alternate or tertian days, but with two paroxysms instead of one, when the patient is said to have a double tertian of another kind—*tertiana duplicata*. By a double quartan is meant, a quartan ague, in which there is a paroxysm superadded on one of the usual days of intermission, but in which the paroxysms occurring on the fourth days only correspond with each other. A quartan may also make its attack only every fourth day, but with two or three paroxysms on that day,—*quartana duplicata*, *q. triplicata*.

The duration of the paroxysm varies very much, not only in the different types of ague, but in different cases of the same type, and even in different paroxysms of the same case. It may be so very short, that the patient shall pass through the cold, hot, and sweating stages in the space of three or four hours, whilst it seldom exceeds sixteen or eighteen; but perhaps from ten to fifteen may be taken as the average. Neither is any great uniformity observable in the relative duration of the individual stages of a paroxysm. The cold stage may not occupy an hour, or it may last se-

veral hours, two hours perhaps being about an average. A similar uncertainty attaches to the hot and sweating stages. With respect to the different types of Ague, it is a general observation, that the quotidian makes its attack in the morning, the tertian at noon, and the quartan in the evening; that the quotidian has the shortest cold stage but the longest paroxysm; the tertian a longer cold stage but a shorter paroxysm; and the quartan the longest cold stage but, upon the whole, the shortest paroxysm;—that the quotidian is more especially characterized by high vascular action; the tertian by the violence of the cold stage; and the quartan by a want of power;—and, that quotidians and tertians are most prevalent in spring; quartans and irregular types in autumn. It must however be confessed, that to each of these reputed peculiarities, there are an infinite number of exceptions.

Complicated Ague.

By Complicated Ague, is meant, an ague, to the ordinary phænomena of which, is superadded some unusual local affection, such local affection being most commonly seated in the abdomen, in the chest, or within the head. The abdominal complication is most frequent, and in this country is most prevalent during summer and autumn. It may not amount to more than that sickness at stomach, and moderate degree of purging, to which many persons in ordinary health are subject at these periods of the year, depending upon the presence of vitiated secretions, especially from the liver. In other instances, however, we have more decided indications of actual inflammation, affecting either the mucous lining of the alimentary canal, the liver, or the spleen, as shown by the presence of the usual symptoms of these respective diseases.

Thoracic affections are most prevalent in winter and spring. They are usually of an inflammatory character, and present the ordinary signs of Bronchitis, of Pleurisy, or of Pneumonia.

With respect to the head, symptoms of irritation or of inflammation of the brain, or its membranes, have not unfrequently been observed to supervene in the progress of an ague, the patient being affected with violent headache, delirium, stupor, coma, convulsions, or rigid spasm.

Irregular Ague.

It has already been stated, that the paroxysms of Ague are often very unsteady in their periods of recurrence, not only in the different types, but in different cases of the same type, and even in different paroxysms of the same case; and that the same uncertainty occasionally applies to the relative duration of the three stages which make up a paroxysm. There are, however, several other irregularities which have now and then been observed to occur in Ague. It sometimes changes its type, the quotidian becoming a tertian, and the latter passing into a quartan, or *vice versâ*. In other instances, the disease maintains no determined type whatever, but is constantly varying, when it is said to be *Erratic*. In some cases, the cold stage has been altogether wanting, in others there has been no hot stage, whilst in others there have been a cold and a hot, but no sweating stage. Occasionally the disease is very imperfectly developed, so that the patient only experiences frequent but irregular chills and a general feeling of indisposition; this is vulgarly expressed by saying that such a person does not shake out, or that he is affected with the *dumb* or *dead* Ague. It has also been observed, that the consequences of exposure to miasmata may simulate, or at least

impart a periodic character to other diseases, such as neuralgia, headache, or even some forms of actual inflammation.

Predisposing Causes.

A predisposition to Ague is produced by whatever tends temporarily to enfeeble, or permanently to impair the powers of the system, such as over-exertion of body or mind, long privation of rest or sleep, the depressing passions, intoxication, cold, excess in venery, scanty or bad nourishment, residence in low and unwholesome situations, and previous disease. Ague has been said to affect the foetus in utero. It certainly now and then attacks the infant at the breast, and is by no means very uncommon in old age; but the period of life during which it is, out of all proportion, most frequently met with, may be reckoned from twenty to fifty. This probably arises from persons, during that period, being almost necessarily more exposed to the exciting cause than either the very young or very old. The unseasoned, or such as come fresh from a pure to a marshy district, are more liable to be affected with ague than those who have been more or less accustomed to exposure; whilst, perhaps the most powerful predisposing cause of all, is, a previous attack, especially if severe or of long duration; it being by no means uncommon to have the disease reproduced in those who have once suffered from it, by causes which in themselves are extremely slight and almost unavoidable; such as, casual exposure to cold, or even swallowing a draught of any cold liquor. The east wind also, is found to increase the prevalence of ague; an effect usually attributed, not so much to its temperature, as to the circumstance of our receiving it in this country, after it has passed over the swampy lands of Holland and Flanders.

Exciting Cause.

So far as we yet know, the exciting cause of Ague is always the same, namely, the effluvia or miasmata arising from the decomposition of vegetable matter under the combined influence of moisture and a certain elevation of temperature. Hence, the frequency of Intermitting fever as an endemic disease in marshy countries or districts;—hence their occasional occurrence, even in lofty situations, after very wet seasons;—and hence their greatest prevalence during spring and autumn in temperate climates. The cold of winter would seem to check that decomposition of vegetable matter, which is productive of the noxious miasmata; but on the approach of spring, when the sun's rays act with increased power, the process appears to recommence, and thereby to give rise to the disease at that particular period; whilst in autumn, a similar consequence results from the same power of the sun acting upon the profusion of vegetable matter at that time falling into decay. The aspect of the disease, however, for the most part, varies accordingly as it occurs at one or other of these periods. The Agues of spring are usually mild, and more or less of a sthenic or inflammatory character; those of autumn are commonly more severe, are attended with greater prostration of strength, and manifest a much stronger tendency to irregularity or to take on the Remitting or Continued form of Marsh fever.

This difference between vernal and autumnal Intermitents, admits, to a certain extent, of explanation. In spring, people in general find themselves in comparatively good health, braced, as it were, by the winter's cold, at the same time that the miasmata which give rise to the disease are known to be much more feebly developed than in autumn.

Hence, the comparative mildness and more sthenic character of Vernal Agues, and hence the common saying, that “an Ague in spring is physic for a king.” In autumn, on the contrary, we find the general strength exhausted and the whole frame relaxed by the oppressive heat of summer ; we have the alvine secretions, especially that from the liver, probably unhealthy or even acrimonious, whilst the miasmata are known to prevail at that time in their highest degree of intensity : hence the greater prostration ; hence the abdominal complications, and hence that aggravation of general disturbance, which in autumn so often masks the intermission and causes Marsh fevers to take on the Remitting or even Continued form.

The length of time that elapses between the exposure to miasmata and the development of the disease, or the period of incubation as it has been called, varies very much. It is probable that the greater the degree of concentration of miasmata, and the more powerfully the ordinary predisposing causes have operated upon the person exposed, the shorter will be the period of incubation. Much also will depend upon individual idiosyncrasy ; some persons being much more susceptible of the operation of miasmata than others.

Prognosis.

The prognosis is to be drawn from a consideration of the age, constitution, and previous habits of the patient ; from the season of the year ; from the type and severity of the fever ; and from its being simple and regular, or complicated and irregular. When Ague occurs in a young person of good constitution and of regular habits, little or no apprehension need be entertained as to the result, especially if it be of the Quotidian or Tertian type, and occur

in spring ; but if, on the contrary, the patient be advanced in years ; if his constitution shall have been broken down by intemperance, hardship, want, or by previous disease ; it is just possible that he may sink under the general disturbance set up by the disorder, especially if it occur in autumn, prove of the Quartan type, or be attended with considerable derangement of the alimentary canal. Should Ague be complicated with inflammation in any part of the body, the danger will be increased proportionately to the severity and the period of the inflammation, and to the importance of the part or organ affected.

The prognosis so far, merely refers to the immediate safety of the patient ; but if it is to extend to his complete and permanent restoration to health, we must carry our inquiries much further, in as much as it very rarely happens, in this climate at least, that a person dies either during a paroxysm or during the continuance of the Ague itself. The real source of apprehension is to be found in the violence done by the disease, or its cause, to the abdominal viscera, and especially the spleen and liver. We know that during the cold stage a remarkable degree of congestion takes place, probably in all the internal organs, but certainly in the spleen and liver, and to such an extent in some very rare instances that the spleen has actually been known to burst and occasion death ; whilst the few that have died during an individual paroxysm, have been observed to expire during the cold stage. We also know that a neglected or obstinate Ague seldom fails to be followed by disordered function or actual change of structure of the organs mentioned, the enlarged spleen from this cause being familiarly known by the name of Ague Cake. It is, accordingly, in these visceral derangements and their consequences, diarrhoea, dysentery, and dropsy, that we

find the real sources of apprehension and danger in Ague ; and hence it is, that so long as the countenance of the individual shall present a bloodless, sallow, or bloated aspect, —until he has recovered his wonted healthy aspect and his usual appetite and strength, we cannot pronounce him altogether secure against the sequelæ of the disease. It must not for a moment be supposed, that a complete cure has been effected, because the patient has ceased to have a return of the paroxysm ; for so far is this from being necessarily the case, that a person from exposure to miasmata may become sallow, unhealthy, and even have visceral disease, ending in fatal consequences, without ever having experienced an attack of Ague at all ; a sufficient evidence that these morbid effects result rather from the operation of the miasmata than from the Ague itself ; how much soever they may be promoted or aggravated by the disease when once developed.

Diagnosis.

Nervous persons, and especially hysterical females, occasionally experience attacks of shivering, perhaps succeeded by something approaching to a hot and sweating stage, but which are so extremely irregular in every respect that it is scarcely possible they can be mistaken for Ague. It is sufficient therefore to be aware of the fact.

Hectic fever bears some resemblance to a Quotidian, and in some rare instances to a Tertian Ague, but it will in general be readily distinguished by the incompleteness and the variable character of its paroxysms. Hectic fever in its most perfect form pretty uniformly comes on in the evening and is followed by morning perspirations ; in hectic fever the cold stage is very commonly either indistinct or altogether wanting ; in hectic fever there is often a

mere unsteady feverishness, little more than an accelerated pulse, with burning heat of the palms of the hands and soles of the feet, aggravated by meals ; in hectic fever the face is pale, frequently with a transient circumscribed flush on one or both cheeks, whilst in Ague the countenance is usually more or less sallow ; hectic fever is almost uniformly associated with suppuration in some part of the body, and, unlike an ordinary ague, produces rapid emaciation and loss of strength.

Paroxysms, irregular in their periods of return but in other respects very much like those of Ague, have occasionally been produced by the passage of a calculus through the gall-ducts or the ureters, and repeatedly by stricture of the urethra and by disease of the prostate gland. All these sources of fallacy ought therefore to be carefully investigated in every case.

Treatment.

In every instance, if practicable, the patient should be removed to a healthy situation or beyond the influence of miasmata. Experience has shown that anything capable of imparting a considerable shock to the system at large, or of merely making a powerful impression upon the mind of the patient, about the period of the expected paroxysm, will occasionally have the effect of lessening its duration and violence, or even preventing its development altogether. Of the means usually employed by the physician for this purpose, emetics are perhaps the most generally applicable and beneficial. Unless contraindicated therefore by pain, irritation, or inflammation of some of the viscera, a brisk emetic may be given about an hour before, or even on the approach of the paroxysm. It may consist of a scruple of ipecacuanha powder and a grain of tartar emetic

in a couple of ounces of simple distilled water ; or of half a dram of sulphate of zinc dissolved in a similar vehicle ; or of five grains of tartar emetic dissolved in as many ounces of water, and given to the extent of a table spoonful every ten minutes till full vomiting is induced.

Opium, is also familiar to the inhabitants of most marshy districts, as a powerful and valuable medicine. When administered in a full dose, a little before the expected paroxysm, it generally renders it milder and shorter ; whilst, similar good effects result from it, when given on the actual approach of the cold stage. Accordingly, thirty or forty minims of laudanum may be given in an ounce of peppermint water for the purpose.

The application of tourniquets so as to arrest a considerable portion of the circulation, has also been found successful in preventing the development of a paroxysm of an Ague. One applied so as to compress the brachial, and another to compress the femoral artery of the opposite side of the body, have had the desired effect, the application being continued a quarter of an hour. Applied during the cold stage, they have sometimes speedily put an end to it, and induced the hot stage.

Treatment of the Paroxysm.

This part of the treatment is merely palliative, the object being to mitigate the sufferings of the patient during an individual paroxysm.

Cold Stage.—If not contraindicated by the circumstances already pointed out, an emetic at the very commencement, or an opiate at any period of its progress, will very commonly be attended with manifest advantage. The patient should be placed in a warm bed ; pans or bottles

of hot water may be folded in flannel and applied to the feet and pit of the stomach; and he may be allowed the free use of warm diluent drinks, or even hot but weak negus or white-wine whey, if not forbidden by a plethoric or highly irritable habit of body, or by signs of local irritation or inflammation. Some have employed warm frictions, some the warm bath, and others the application of hot air. It has also recently been recommended to bleed from the arm during the cold stage; but although cases may unquestionably be quoted in its favour, experience has shown that, as a general remedy, it is not entitled to much credit, whilst, in the hands of the inexperienced at least, it might probably be followed by unpleasant if not dangerous consequences.

Hot Stage.—When this stage commences, the quantity of bedclothes should be diminished and cooling drinks substituted for the warm diluents. These cooling drinks may consist of the common effervescing draught, of lemonade, or of the compound infusion of roses either alone or with four or five grains of nitre to each dose. Opium, has also at this period, been occasionally found to diminish the thirst, headache, and burning heat of skin, to shorten the stage and promote perspiration. Unless contraindicated therefore, by the existence of obvious congestion or inflammation, thirty or forty minims of laudanum may be administered; although, it appears to be a less desirable or necessary practice in this, than in the cold stage. Some have recommended cold sponging either with water or vinegar and water, and others the tepid or cold affusion. Venesection, in the hot stage of simple Ague, having only, in general, the effect of affording temporary relief, does not constitute either a necessary or important part of the practice; whilst, as it regards the diaphoretics and purgatives which have been

recommended, the short duration of this stage of the paroxysm can scarcely be supposed to admit of such an application of them, as is calculated to effect any very useful purpose.

Sweating stage.—All that is required at this period is to avoid premature exposure, and administer tepid diluent drinks, should the patient complain of thirst. If much languor prevail, there may be added to these drinks, a little wine or spice.

Treatment during the Intermission.

The object of the treatment during the intermission, is to prevent the recurrence of the paroxysms, or, in other words, to cure the disease. This is to be effected by the administration of certain medicines, which, generally speaking, rank under the class of tonics. The principal of these is the cinchona, or Peruvian bark, which is commonly exhibited either in the form of powder or of the sulphate of quinine. There are two modes in which the cinchona has been recommended to be given; either in divided doses during the entire intermission, or in one large dose immediately before the expected paroxysm and at that time only. But, although the latter mode is said, when successful, to effect a cure with the least expenditure of the drug, experience has shown that it often fails in putting a permanent stop to the disease, and that patients so treated are much more susceptible of a relapse than when treated according to the former plan. It is only therefore when we are particularly anxious to prevent the recurrence of a paroxysm, and especially when that recurrence is close at hand, that this practice ought to be preferred. Under such circumstances, however, eight, ten, or twelve grains of the sulphate of quinine may be given at once, either in solution

in a vehicle acidulated with sulphuric acid, such as the compound infusion of roses ; or, in the form of pills or a bolus. Some have given half an ounce of the powdered bark for the purpose, but it is much more liable to offend the stomach and disgust the patient than the less bulky sulphate of quinine.

By far the best and most effectual method of combating the disease, is to administer our remedies in divided doses during the entire intermission. A dram of the powdered cinchona, or what is much better, about three grains of the sulphate of quinine, may be given every two hours in a quotidian ; every three hours in a tertian ; or every four hours in a quartan ; increasing either the frequency or the quantity of the dose, should our first efforts fail in preventing, or at least considerably mitigating, the violence of the next expected paroxysm.

Another remedy, rivalling if not actually surpassing the cinchona in power, is the arsenious acid, commonly called white oxide of arsenic, or simply arsenic. This is commonly exhibited in the form of arsenite of potash, as we find it in Fowler's mineral solution, the liquor arsenicalis of our Pharmacopœia. Four, five, or six minims may be given three or four times a day, combined with as many minims of laudanum to prevent the nausea and pains in the stomach and bowels to which it frequently gives rise. The vehicle may be an ounce or ounce and half of distilled water, or of any aromatic distilled water, or of the infusion of cascarilla.

Several other medicines of the tonic class, although of greatly inferior power to those already mentioned, have been given with success. Of these, perhaps, the most efficacious is the willow bark, which may be administered in the form of powder, in doses of a dram ; or, in the form of its proximate principle, salicine, made into pills, in doses

of five or six grains. Many astringents and bitters have also, either alone or in combination, proved adequate to the cure of Ague. The principle of these are the gentian, chamomile, cusparia, sweet-scented flag, oak bark, and tormentil root. From the mineral kingdom, the chalybeates and the sulphates of zinc and copper have now and then been successful. Besides these, it is only necessary to mention, that sulphur, the snuff of a candle, coffee, and the web of the black spider, have each had their advocates in some cases.

Treatment of Complicated Ague.

The treatment of *Irregular*, is the same as that of regular Ague; and as it regards complicated Ague, the modification of treatment applicable, will of course depend upon the nature and degree of the complication.

It has already been observed, that a mere residence in an aguish district will often suffice to derange the functions and even the structure of the abdominal viscera; and it has also been shown, that the repetitions of the paroxysms have a similar tendency; it is therefore a good and safe practice in every form of Ague to commence our treatment by unloading the bowels, and endeavouring to promote the flow of the abdominal secretions. This is to be done by mercurial purgatives and mercurial alteratives. Four or five grains of calomel, followed in a few hours by a smart dose of compound infusion of senna and Epsom salts; or ten grains of the compound extract of colocynth and three of calomel; or a grain of calomel or five grains of mercurial pill every hour for four hours, followed after the last dose if necessary by the senna and salts, or an ounce of castor oil may be given immediately. Any of these

forms of mercurial purge may be repeated every two or three days during the whole of the subsequent treatment. In other instances, especially if the patient have been long exposed to the miasmata, or if the disease be of long standing, a grain of calomel, or five grains of mercurial pill, may be given every night, or night and morning, with only an occasional dose of senna and salts or castor oil, at the same time that we are administering the cinchona or other medicine to prevent the recurrence of the paroxysm.

Should a purging be present, which is not unfrequently the case, especially in autumn, it will in general be necessary to moderate or remove it before having recourse to the usual remedies for putting a stop to the paroxysms. The alvine discharges will commonly be found, under such circumstances, of a bilious or unhealthy character. The bowels, therefore, should be well freed from their irritating contents, by a scruple of powdered rhubarb, or by two or three drachms of castor oil, or by emollient enemata; after which, attempts should be made to correct the secretions by means of the mildest mercurials, combined with some form of opium, or with chalk, or with both. Three grains of the *hydrargyrum cum cretâ* with four of the *pulv. ipecac. comp.* or eight or ten of the *confect. opii*, or a scruple of *cret. ppt.* may be given twice a day with very great advantage in such cases, regulating the doses, however, according to the effects produced. So great is the influence of the deranged condition of the abdominal viscera, that in many instances, all our ordinary remedies entirely fail, until it has been thus mitigated or removed; whilst, even if apparently successful, relapses are frequently experienced from comparatively slight causes. It is probably owing to these circumstances that mercury has been by some regarded as capable of curing ague; but, although mercury will often,

by correcting the state of the abdominal viscera, or by removing some other local disease, enable remedies to cure an ague, when they had previously failed to do so; and although after trying ordinary remedies in vain for some time, mercury alone has appeared to cure the disease, certain it is, that the specific action of mercury on the system, is by no means incompatible with the continuance of an ague.

Should local pain, or other symptoms, indicate the existence of congestion or inflammation in the liver, or the spleen, or within the head, it will be prudent and often quite necessary, to subdue these local affections before having recourse to the remedies usually applicable during the intermission. For this purpose, venesection, cupping, leeching, and blistering must be employed, according to the age and constitution of the patient, and other circumstances of the case: depletion being followed by mercurials and other means suited to these respective complications. As soon as these local affections have been overcome, we may proceed to put a stop to the paroxysms. It is in such cases that the cinchona occasionally proves too exciting and irritating, and in which the liq. arsenicalis will in general be found to answer the purpose better.

The treatment that has been found most successful in removing the enlargement of the spleen or ague cake, consists in the application of cupping-glasses and leeches, blisters, poultices, mercurial inunction or mercurial plaster to the region of the spleen, mild diet, gentle laxatives, and the internal and external use of iodine and hydriodate of potash, and occasionally quinine.

The dysenteries and dropsies which occasionally result from ague, or from long-continued exposure to miasmata, must, of course, be treated according to the principles, which will be pointed out in another part of this work.

After recovery from ague, the patient should carefully avoid further exposure to miasmata; he should go warmly clothed; avoid damp and cold, and especially night air; he should observe a temperate and regular mode of life, endeavouring to complete his restoration to perfect health, by occasional mercurial laxatives, or mercurial alteratives, and gentle tonics, such as bitters with soda or potash.

REMITTENT FEVER.

Remittent fevers are closely allied to Intermittents; they arise from the same cause; they present in many respects the same phænomena; and, require a very analogous mode of treatment.

A Remittent fever varies in its mode of attack. A person may experience a feeling of general indisposition for some days previous to the development of any very urgent symptoms. It is more usual, however, for the disease to come on somewhat suddenly, with languor, lassitude, yawning and stretching, dejection of spirits, loss of appetite, chilliness, especially in the course of the spine, and occasionally amounting to actual shivering; pains or aching in the back and limbs, and a dull pain or sense of confusion in the head. To these symptoms a reaction presently succeeds, characterized by heat and dryness of the surface, flushing of the face, thirst, increased pain or confusion in the head, hurried respiration, a frequent, full, and often hard pulse, and a dry, white, and furred tongue. At this period too, the patient experiences not only a sense of load and oppression at the scrobiculus cordis, but also a feeling of constriction or perhaps actual pain, extending from thence to the back and into the hypochondriac regions. This pain at the scrobiculus cordis

is for the most part, considerably increased by pressure, and is often attended with nausea, or even vomiting of an unhealthy bilious-looking matter. The urine is high-coloured but without sediment; the bowels sometimes constipated, but occasionally relaxed; the stools under such circumstances, being generally dark, bilious, and offensive. Having persisted, during a variable period of from eight or ten, to, perhaps, fourteen or sixteen hours, these symptoms begin gradually to subside; a perspiration more or less copious breaks forth; the skin cools; the tongue becomes moist; the thirst abates; the headache diminishes or ceases altogether; the respiration gets more free and less hurried; the pulse softer and slower; the urine deposits a lateritious sediment; and the patient probably feels himself comparatively well. He is never, however, as in an intermittent, altogether free from some degree of febrile excitement or local disorder, and sooner or later experiences a recurrence of the symptoms enumerated as characterizing what may be considered the two latter or hot and sweating stages of the original paroxysm; for, it very often happens that the cold stage is either very slight or altogether imperceptible in the paroxysms that follow. It is by no means uncommon, however, for subsequent paroxysms to commence with a distinct chilliness; or even, though more rarely, with a strongly marked shivering.

Such are the symptoms, and such the progress of a paroxysm of a Remittent fever, as it usually occurs in this country. It nevertheless presents many varieties, according to the state of the patient's constitution, the season of the year, and the intensity of the predisposing and exciting causes. It is now and then so mild, that the paroxysms are very imperfectly developed, consisting, perhaps, of merely a chilliness or creeping, felt once or twice

in the twenty-four hours, followed by a slight and vague reaction; at other times, especially when the miasmata proceed from an offensively putrid source, when the heat of the weather is intense, or when the abdominal viscera are much deranged, the disease takes on so aggravated a form, and the remissions become so extremely indistinct, that it is almost impossible to distinguish it from a severe case of genuine Typhus or Continued fever. Between these extremes, we meet with every variety.

As Remittent fevers, like Intermittents, arise from miasmata, and as Remittent and Intermittent fevers mutually pass into each other, they can only be regarded as modifications of the same disease; the real difference between them depending upon the accidental presence in Remitting fever, of some general or local source of disturbance, which has the effect of keeping up such excitement in the system as to prevent the return of a perfect apyrexia after each paroxysm; instead of which, the symptoms only undergo a mitigation or remission. Of the causes which act upon the system at large, so as to have this effect, the most frequent are, cold, vicissitudes, long-continued exposure to great heat, and perhaps a concentrated state of the miasmata. With respect to the local sources of that general excitement which interferes with the intermission or apyrexia in Remittents, it may be safely affirmed, that in almost every instance they are to be found in the abdominal viscera, and especially in the liver and alimentary canal. The derangement of these organs varies both in kind and degree; it may consist in mere irritation and disordered function, or it may amount to actual inflammation; the aspect and violence of the disease varying accordingly. Hence, the greater prevalence and more aggravated forms of Remittent fevers in the autumn of temperate climates;

hence probably the greater malignity and rapid mortality of Remittents within the tropics ; and hence the frequent conversion of a Remittent into an Intermittent by the judicious use of remedies calculated to correct the morbid condition of the irritated or inflamed organs.

Diseases set up in other organs than those mentioned, may undoubtedly produce a similar effect, but they are of comparatively rare occurrence ; whilst, the derangements of the abdominal viscera constitute a most important, if not an essential part of almost every Remittent fever.

Diagnosis.

The difference between an Intermittent and a Remittent fever has been already shown, and it is for the most part sufficiently obvious ; but it is not at all times so easy to distinguish certain modifications of a Remittent from an ordinary Continued fever ; a distinction too, of infinite importance, in as much as it most materially influences both our prognosis and our practice. In autumn, when the sun acts with great power, when the miasmata are concentrated, and especially when the abdominal viscera are much disturbed, a Marsh or Remittent fever often puts on all the appearances of a severe form of common Continued or Typhus fever ; presenting, a hot and parched skin, a flushed face, a rapid pulse, violent headache or delirium, a dry brown or almost black tongue and great prostration of strength ; together with great bowel irritation, as shown by flatulency, distension and pain, and by frequent loose dark and bilious-looking stools. Such a fever is by no means very uncommon, and certainly at first sight is not by the symptoms to be distinguished from Continued fever. It is chiefly therefore by attending to the history of the case, and by carefully watching its progress, that we can

arrive at a correct diagnosis. If it occur in autumn, and if the person is ascertained to have been exposed to miasmata, we ought at all times to suspect the true nature of the case; and if, whilst attentively observing it, we discover that at some uncertain time of the day or night, the patient experiences a chilliness or shivering, followed by a decided aggravation of febrile disturbance, and this again, by sweating, or by a manifest and considerable mitigation, little doubt will remain: or, should such indications prove too slight to decide the question for a day or two, it will very commonly happen, when by the use of proper remedies we have subdued the general excitement, and removed any source of local irritation, that the remissions and exacerbations will become sufficiently distinct to enable us to decide without either doubt or difficulty: for, we pretty uniformly find, that as the general excitement and local irritations are corrected, in the same proportion does the disease assume a more decidedly Remittent, or even, on some occasions, an Intermittent type.

It must also be remembered, that when fever is produced by miasmata emanating from sewers, cesspools, stagnant ditches, and suchlike offensive sources, it sometimes assumes all the virulence and malignity of typhus; and is scarcely to be distinguished from it, except by a knowledge of its origin, by the effect of remedies, and by its not proving contagious. Whether fever so produced ever does become true and genuine typhus, the disorder being altogether similarly affected by the same remedies, and proving equally contagious, remains to be demonstrated, and is not very probable.

When, in a common Continued fever, the mucous membrane of the ilium is considerably involved, that disease

often puts on a good deal of a remittent, or rather an irregularly hectic form ; the patient experiencing frequent exacerbations and remissions, not perhaps preceded by chilliness or succeeded by much sweating, yet sufficiently well marked to have led some experienced physicians to designate and regard them as Remittent fevers. It is not impossible, indeed, that the causes of Intermittent and of Typhus fever may cooperate, and thus produce a twofold disease ; but well-attested cases of the kind appear to be extremely rare ; whilst, there is very little doubt that the source of fallacy just pointed out has had a considerable share in inducing some to believe in their frequent occurrence.

With respect to the diagnosis between Remittent and Hectic fever, the presence of suppuration in the latter, will for the most part readily decide the question ; or, should the existence of suppuration be equivocal, we must expect to find the paroxysms of Hectic, milder in degree and more irregularly developed, than in any Remittent in which there could exist a doubt. The pale face, the circumscribed flush upon the cheek, the perhaps morbidly clean tongue, and the rapid emaciation of Hectic, will in general, strikingly contrast with the sallow complexion, the anxious countenance, and loaded tongue of a Remittent ; to say nothing of the assistance to be derived from the history of the case.

Prognosis.

Within the tropics, where the sun acts upon the body with great power, where the miasmata are abundant, and where the abdominal viscera are proverbially liable to disorder, Remittent fever is at all times a prevalent, a severe, and often a rapidly fatal disease ; especially, when it attacks the newly arrived and unseasoned European. We ac-

cordingly find, that in proportion as the condition and circumstances of temperate climates approach in kind and degree to those of the tropics, Remittent fever is prevalent and severe. The nearest approach is in autumn, at which period alone, Remittent fever can in general, be said to be attended with any immediate danger in temperate climates. Should it occur, therefore, at this season of the year, should the patient be old or of bad habit of body, or should he already be labouring under viscerai disease, it may undoubtedly destroy life, and especially so, if with these aggravating circumstances we have inflammation or great disorder of the intestines, or of any other important organ of the body. In a very large proportion of cases of Remittent fever, as it occurs in our own climate, there is little or no immediate danger to be apprehended, especially when the patient is young, of good constitution, and when proper remedies are early had recourse to : indeed, many such cases cease spontaneously as soon as the general excitement and local irritation have been subdued, without requiring those means which are usually found necessary for the complete cure of Marsh fevers. A neglected Remittent however, like a neglected Intermittent, may inflict such serious and permanent injury on some of the viscera, and especially those of the abdomen, as to lead ultimately to fatal disease, under the form perhaps of dropsy or dysentery.

Treatment of Remittent Fever.

The indications are, first, to subdue or remove that general febrile excitement which prevents the intermission, and thereby converts into a Remittent, what would otherwise prove an Intermittent ; and, secondly, to complete the

cure, according to the same principles as apply to Intermittents.

For fulfilling the first indication, our most powerful remedy is undoubtedly general blood-letting, which, although upon the whole not often required, may nevertheless in some instances be employed to a moderate extent with much advantage. Should the patient be young and of good constitution, and should the symptoms be severe, as indicated by great heat of skin, by flushing of the face, by pain in the head, and by the firmness and fullness of the pulse; twelve or sixteen ounces of blood may be taken from the arm at the very commencement, and repeated afterwards, if considered necessary. Having decided upon the propriety of general blood-letting, in order to subdue the violence of the general fever, our next and grand object in every case of Remittent fever, will be to ascertain if there do not exist some local irritation or inflammation which is producing or aggravating the permanent febrile disturbance. This will very often be found to be the case; for, although long-continued exposure to great heat, to concentrated miasmata, or to vicissitudes of temperature, may occasionally give rise to it; it perhaps more frequently happens that the real and true cause of the remission taking the place of the intermission, is some local disturbance, and this most commonly in the abdominal viscera. This is so true, that as a general rule, no considerable depletion should be effected before some means have been directed to the relief of the organs so irritated; for, should the general febrile state present, be the result of such local causes, we might be betrayed into the adoption of unnecessarily active treatment. If there be pain in the region of the liver or spleen, or at the scrobiculus cordis; or should there be pain, disten-

sion, and flatulence of the bowels, with frequent liquid unhealthy stools ; our remedies must at once be directed to the relief of the affected organs. If the pain in the region of the liver or spleen be increased upon pressure, there will be good reason to suspect the existence of inflammation, or at least of considerable congestion ; and local depletion must be had recourse to, by means of cupping or leeching, to an amount regulated by the age and constitution of the patient, and to the severity of the pain.

The bowels ought now to be well cleared of their vitiated contents ; and, indeed, of such importance is this part of the treatment, and so difficult is it in many instances to determine how much of the local suffering depends upon mere irritation in the alimentary canal, and how much upon more decided inflammatory action, that it is at all times a good and safe practice, freely to evacuate the bowels in the first instance, after which should the pain continue, cupping or leeching may be had recourse to with the greatest confidence. The purgatives best adapted to fulfil the object we have in view, are such, as not only have the effect of unloading the bowels, but tend at the same time to correct the abdominal secretions. Such are the mercurial purges. If the bowels are constipated, five grains of calomel in the form of pill may be given at once, followed in four or five hours by a draught of the compound infusion of senna and sulphate of magnesia, or a grain of calomel or five grains of blue pill may be given every hour for four hours, followed by a similar purging draught ; or, three or four grains of calomel and fifteen or twenty grains of rhubarb may be preferred, especially if the excitement be accompanied by considerable prostration of strength. Any of these purges may be repeated from time to time ; or what is perhaps better, a grain of calomel or five grains of blue pill may be

given twice a day, with a draught of senna and salts, or of castor oil occasionally.

If a purging be present, the same principles of treatment must be steadily kept in view. The bowels should be freed from their irritating contents by some mild laxative, given either by the mouth or in the form of glyster. If the pain, irritation, and purging, be not very violent, two or three grains of calomel and fifteen of rhubarb, or the hydrargyrum cum cretâ in a dose of four or six grains, followed in four hours by two, three, or four drams of castor oil, and four or five minims of laudanum, will often answer the purpose exceedingly well; whilst, even in the most aggravated cases, two or three drams of castor oil, with a few minims of tincture of opium, may be given on the surface of some aromatic distilled water; or ten or fifteen grains of powdered rhubarb in any convenient vehicle. In other instances, great benefit will be derived from a glyster composed of a pint of warm gruel or barley water, which will often have the effect of promoting the discharge of irritating matters, and at the same time, exert a soothing influence in allaying the local irritation. After evacuating the bowels of their vitiated contents, we must endeavour to correct the secretions by administering mild mercurials, guarded either by chalk or by opium, or by both. Two or three grains of the hyd. c. cretâ may be given with eight or ten of the conf. opii, or with four or five grains of pulv. ipecac. co. twice or thrice a day; or the hyd. c. cretâ may be prevented irritating the bowels by the mist. cretâ, to each dose of which may be added from four to ten minims of tinct. opii. In some severe cases, the excessive purging may be sufficiently restrained by a glyster of four ounces of thin starch and from half a dram to a dram of tinct. opii, or half an ounce to an ounce, of syrup. papaveris.

Having succeeded in subduing to a certain extent the general excitement, having relieved any local irritation that may happen to have been present, and having carried into effect the proper remedies for correcting the alvine discharges, the rest of the treatment is very simple. The antiphlogistic regimen and the use of mucilaginous drinks will at all times be proper, and unless contra-indicated by irritability of the stomach or bowels, some mild diaphoretic, such as the liq. ammon. acet. with or without a few minims of vin. ant. tart. may be given. In other instances, the common effervescing draught may be freely allowed, as it will tend to allay thirst, and will moreover prove refreshing to the feelings of the patient.

It will generally be found, that under this mode of treatment, the disease will give way, and either subside altogether, or the remissions becoming more and more considerable, it will take on a more decidedly intermittent character. In the latter case, we may confidently have recourse to the sulphate of quinine, or perhaps in some instances, to the arsenical solution. It must nevertheless be carefully remembered, that it is by no means necessary that the disease should be reduced to one of a truly intermittent type, to justify the administration of the sulphate of quinine. On the contrary, when the disease occurs in old people, and in those of impaired constitution, it will very often not only be safe but necessary to have recourse to it as soon as we have succeeded to some extent in subduing the general excitement, and in relieving individual organs, notwithstanding the continuance of symptoms which in a common Continued fever are regarded as contra-indicating its use. Under the circumstances mentioned, a moderate heat of skin and frequency of pulse, some degree of headache and a foul, loaded, or even dry

and brown tongue, ought rather to encourage than deter us from the cautious exhibition of the drug ; all these symptoms frequently being observed speedily to subside under its use, and thereby furnishing a sufficient evidence of the pathological difference between a Marsh and a common Continued fever, how much soever they may correspond in their external aspect.

Of course, should inflammation occur in any other part or organ of the body, it must be immediately attended to, and treated on common principles.

INFANTILE REMITTENT FEVER.

When a child of from one to eight or ten years of age, has a pale, muddy, and dejected or anxious countenance ; a foul tongue ; a tumid belly ; an irregular appetite, and a morbid state of the bowels ; when it picks its nose, and is fretful and restless when awake, and whines, moans, or starts in its sleep, that child is vulgarly said to be suffering from *worms*. If, together with the above symptoms, the child experience occasional accessions of febrile excitement, it is in like manner said to be the subject of *worm fever*.

These terms, familiar to the unprofessional public, have, as usual, their foundation in correct observation, the diseased conditions alluded to, being uniformly associated with derangement of the primæ viæ, and not unfrequently with worms. By the profession, the accompanying fever has been designated *Gastric*, or more commonly Infantile Remittent fever.

With or without fever, the disease is one of extremely frequent occurrence, and moreover one of vast importance, in consequence of the powerful influence which greater or

less degrees of it have in modifying, or in actually inducing, a very large proportion of the disorders incident to early life.

The drooping and listlessness of the child, the muddy or pale face, the languid expression, the dark areola around the eyes, and the dilated or unsteady pupil, at once arrest the attention of the observant practitioner, who, on inquiry, is usually informed that the child, without any assignable cause, began to droop and waste in flesh; that its appetite is impaired, voracious, or capricious; that it occasionally complains of pain in its stomach or head; and that the alvine discharges are offensive and of a dark, pale, green, slate, or clay colour; that the child moans, starts, or grinds its teeth during the night; and that it picks its nose during the day. On examination, the tongue is usually found coated with a white mucus, most considerable towards the base; the belly more or less distended; and the breath nauseous or otherwise offensive.

This state of disease may continue for an indefinite period, with the effect of merely occasioning more or less emaciation and loss of healthy complexion, and may be gradually removed either by the voluntary efforts of the constitution, or by the timely interference of art.

Should these symptoms, however, be disregarded, it very often happens that the child begins to experience irregular exacerbations of febrile excitement, often leading the parents to declare that the child is at one time pale and cold, at another burnt up with fever and parched with thirst.

The febrile exacerbations vary much in their intensity, frequency, and duration. There may be one, two or even three, in the course of the twenty-four hours; that in the evening being commonly the most severe.

Each exacerbation is marked by restlessness and impatience of any disturbance; a hot and dry skin; a flush on one or both cheeks, especially in those who have a fair and delicate skin; remarkable drowsiness; some hurry of respiration; feebleness of the voice; a short hacking cough; a frequent pulse; more or less thirst; and picking of the nose, lips, tongue, or some other part of the surface: these symptoms varying both in number and degree in different cases. On the subsidence of the paroxysm, the skin cools and relaxes, but in general without much perspiration; the urine deposits a sediment; universal relief succeeds; and the child is left comparatively free from bodily suffering or mental dejection.

If, however, the disease be allowed to proceed uncontrolled, the exacerbations are liable to become more and more severe, and the remissions less distinct; the appetite is entirely lost; the thirst becomes incessant; the tongue gets dry and brown; the lips and teeth covered with a dark sticky mucus; the voice husky or suppressed; the hacking cough more distressing; delirium supervenes; and the debility and emaciation increase, till the patient sinks completely exhausted; or, symptoms of hydrocephalus supervening, coma or convulsions more abruptly close the scene.

For the convenience of description, the symptoms enumerated may, with some propriety, be divided into three groups or orders: the first, characterizing cases unattended by any febrile exacerbation whatever; the second, cases with moderate but distinct febrile exacerbations; and the third, cases of great severity, in which the exacerbations are so acute, and the remissions so imperfect, that the disease approaches the character of a Continued fever.

But, although we occasionally find these three orders of

cases regularly succeeding each other as has been described, it must be confessed that in practice, they are met with existing in various relative degrees, and apparently more or less apart from each other. Cases of the first order are most frequently met with; those of the second may succeed to the first, or the symptoms of the second may be the earliest to attract attention; whilst the third order may succeed to the first, or to the second, or the symptoms of the third may suddenly and abruptly supervene without having been preceded by either: these several varieties, as well as the intensity of each, depending upon the degree of visceral derangement present, the susceptibility of the individual, the state of the constitution, and the situation and condition of the patient at the time.

It is the more sudden and acute febrile forms of the disease that have more especially usurped the name of Infantile Remittent fever, whilst other distinctive terms have been superadded to this, according to the progress, form, and severity of particular cases. Such distinctions, however, appear to be altogether unnecessary, and perhaps tend rather to obscure than to elucidate the pathology of the complaint. It may suffice to state, that when the exacerbations are slight, the disease may last from two to six or eight weeks; that the more sudden and acute forms, under proper treatment, will generally yield in from two to four weeks; and that in almost every instance the disease yields in a gradual and comparatively slow manner, without any very appreciable crisis or critical discharge.

As already observed, it is in all its forms associated with derangement, probably of the abdominal viscera generally, but of the stomach and intestinal canal in particular. With respect to the precise or essential nature of that derangement, we are in possession of no very satisfactory informa-

tion. The symptoms, and especially the condition of the alvine discharges, abundantly attest the existence of disturbed function and consequent deranged secretion; but how often and how much a state of congestion or of actual inflammatory action takes place, it is much more difficult to determine. It is probable, however, that more or less of inflammatory action does exist in the mucous membrane of the small intestines, whenever febrile exacerbations prevail, and especially when they prevail in an aggravated degree: accordingly, although on dissection we for the most part discover little remarkable, nevertheless, indications of inflammation, or even of ulceration of the mucous membrane of the stomach and small intestines, have now and then been observed.

Causes.

The predisposing causes are not very apparent, but, *cæteris paribus*, children, with a fair and delicate skin, of sanguine temperament, and irritable habit, are most frequently the subjects of the febrile forms, and especially of the sudden and acute attacks of the disorder; whilst children of dark complexion and of a sluggish and melancholic temperament, are perhaps even more liable to the disease in its apyretic form.

The *Exciting Causes* are unwholesome or scanty diet; too frequent, irregular, or over feeding, especially with strong and stimulating food; residence in ill-ventilated or otherwise insalubrious habitations or localities; dentition; previous disease, especially such as interferes materially with the healthy functions of the skin, as Small-pox, Measles, and Scarlet fever. Worms have been much dwelt upon as an exciting cause, but they are only occasionally observed; and perhaps it would be more correct

to say, that the particular condition of the intestines present, favours their lodgment, development, and propagation, than that they of themselves prove an immediate cause of the disorder.

Not the least important circumstance connected with the diseased condition of the body now under consideration, is, the vast influence which it exerts in producing, modifying, or predisposing to, other disorders incident to early life. In its most acute febrile form it is now and then observed to cause the abrupt development of hydrocephalus, and when the fever is less acute or continuous, it not unfrequently leads to enlargement and obstruction of the mesenteric glands and to consequent tabes. It is the more chronic or apyretic form of the disease, however, which seems to exercise the most powerful and insidious influence in favouring or causing the development of disease in early life; the form of the disease varying according to the predisposition existing in individual organs or in individual constitutions. It is under such circumstances, that Scrofula is so repeatedly observed to show itself, either in the form of diseased mesenteric or lymphatic glands, chronic abscesses, diseased joints, or Phthisis Pulmonalis. It is under similar circumstances that infants have the Strophulus; and children, irritable retina, Porrigo, Impetigo, Ecthyma, Rupia, or Pompholyx developed; and it is in connexion with more or less of this state, that we so often find Chorea, and tubercular or hydrocephalic disease of the brain.

Prognosis.

It is from a due consideration of the nature and degree of these accidental complications, rather than from the severity of the disease itself, that we are to draw our

prognosis, the disease being very rarely attended with much danger if early and properly treated; whilst some of the complications are, on the contrary, fraught with considerable peril, or are altogether hopeless.

Diagnosis.

Like Remittent fever in the adult it has been confounded with Heetic, and is to be distinguished from it in the manner already pointed out. It may, however, be observed, that phthisis and neglected pleurisy are frequent sources of such hectic in young subjects. The disease has also been confounded with chronic peritonitis, psoas abscess, and perhaps idiopathic tabes mesenterica.

Treatment.

The treatment in detail will of course vary according to the nature of the symptoms present, but in every case the indications are, to remove offending matters from the intestines, to correct the secretions, and to regulate the diet and regimen of the patient. In that apyretic modification, vulgarly regarded as indicative of worms, the treatment is very simple. To free the intestines from their vitiated contents, one, two, or three grains of calomel, according to the age of the patient, with from four to twelve grains of rhubarb, or of jalap, may be given. The rhubarb is preferable when there is a want of power, the jalap when there is greater vigour of constitution. In some instances, where the bowels are sluggish, from two to eight or ten grains of finely powdered scammony, with from one to three grains of calomel, and a little of some aromatic, such as ginger, will answer the purpose exceedingly well.

Such purgatives may be repeated every alternate day, or twice a week, for a period regulated by the effect. Upon the whole, however, it is perhaps better, after one or

two such purges, to endeavour to correct the secretions by moderate and divided doses of mercury, exhibiting a purgative occasionally, as it may be required.

When the bowels are not irritable, or relaxed, half a grain or a grain of calomel may be given every night and morning, mixed with a little compound tragacanth powder, or white sugar; or the calomel may be given with from three to six or eight grains of the dried subcarbonate of soda, so as to form, when mixed with a fluid, the grey protoxide of mercury, a mild and efficient mercurial. To the latter compound eight or ten grains of the compound chalk powder may sometimes be added with advantage. When the bowels are irritable, the hydrargyrum cum cretâ ought to be preferred, either alone, in doses of from two to four grains, or with an additional quantity of chalk. If, notwithstanding these mercurials, a laxative should be required, a little of some of the neutral salts, alone, or with carbonate of magnesia, or compound infusion of senna, may be exhibited occasionally; or what sometimes answers the purpose exceedingly well, a moderate dose of a mixture containing carbonate of soda and sulphate of soda once or oftener in the twenty-four hours, so as to keep up at all times a gentle action upon the bowels.

Under this simple treatment, and a due regard to good air, proper exercise, a mild, bland, and moderately nutritious diet, consisting chiefly of farinaceous food, but with beef tea, mutton broth, animal jelly, or plain dressed meat once a day, children will in general speedily rally, the excretions improving in appearance, the appetite becoming more natural, and the complexion assuming a more healthy aspect. It is but right, however, to observe, that after having succeeded to a certain extent in removing the morbid condition of the intestines, the little

patients will often derive considerable benefit from the occasional use of the warm-bath ; and that convalescence will often be promoted, and a relapse rendered less probable by a cautious exhibition of mild bitter tonics, such as the infusions of gentian, calumba, or cascarilla, with or without a few grains of carbonate of soda, and rendered more palatable by the addition of the mixture or syrup of orange-peel, or of some of the more agreeable essential oils. In some instances the sulphate of quinine, and at a more advanced period of convalescence in others, the chalybeates prove exceedingly beneficial. In the treatment of the most acute febrile forms of the disease the same principles must be kept in view. The child should be put to bed in a well-ventilated apartment, and be very lightly covered with bedclothes ; all solid and animal food should be withheld, and slops substituted, one of the best of which is well-made barley-water flavoured with fresh lemon-peel and properly sweetened with white sugar. It answers the twofold purpose of food and drink, provided children can be prevailed upon to take it.

At the very commencement, unless diarrhœa prevail, a brisk laxative of rhubarb and calomel, or of jalap and calomel, or of calomel followed by senna and salts, should be administered to unload the bowels. After this the patient may be directed to take some mild diaphoretic three or four times a day, such as the liquor ammoniæ acetatis in distilled water, with a few drops of the spiritus ætheris nitrici and a little syrup of orange-peel. Sometimes a few drops of vinum ipecacuanhæ, or vinum antimonii tartarizati appear to increase the diaphoretic effect. In other instances from eight to fifteen grains of carbonate of soda in distilled water, with syrup of orange-peel given three or four times a day, appears to answer much better.

Some endeavour to correct the state of the alimentary canal by a repetition of mercurial purges, others by giving mercury in small and divided doses, with a laxative occasionally.

When constipation prevails, it is perhaps of little moment which of these plans we adopt; but upon the whole, the less we add to the irritation of the digestive organs in such acute cases the better, and very small doses of mercury will sometimes do this. Indeed, it would appear as if mercurials were less indispensable in these acute forms than when the excitement is absent; and many such acute cases will do exceedingly well by merely administering, two or three times a day, a mild dose of some saline laxative to keep up a gentle action upon the bowels, such as magnesia and salts, or carbonate and sulphate of soda.

When a purging prevails, which is by no means unfrequently the case, still greater caution is required in the administration of mercurials; for here, as in the common fever of adults, great mischief has unquestionably been done by the too free use of mercury in irritated or inflamed conditions of the mucous membrane of the bowels. In such cases, after having freed the bowels from any irritating matters by a little rhubarb or a little castor oil, the irritation may be allayed, and the diarrhoea moderated by the chalk mixture, to which, occasionally, but very rarely, a drop or two of laudanum may be added.

When the discharges are both profuse and of unhealthy aspect, the hydrargyrum cum cretâ may, undoubtedly, be useful, but it must at all times be given with caution, and can very often be dispensed with, notwithstanding its exhibition may be indicated by the character of the evacuations.

As severe cases advance, symptoms sometimes arise which require particular treatment. The hacking cough and restlessness may occasionally be relieved by a few drops of tincture of hyoscyamus or a grain or two of extract of conium added to any mixture in use at the time. It is much more rarely advisable to employ syrup of poppies or laudanum. Should the head become particularly affected, cold evaporating lotions, or even leeches, may be had recourse to. In the very advanced stage of the disease too, when the general strength is much reduced, we must endeavour to sustain it, by giving a more nourishing diet. For this purpose, besides the ordinary fare of arrowroot, sago and gruel, the patient may be allowed a certain quantity of beef tea, or calf's foot jelly, or broth. Whatever may be said of extreme cases, tonic medicines are rarely of much use previous to the approach of convalescence, at which period the mildest of those already mentioned may occasionally be given with advantage.

CONTINUED FEVER.

The common Continued fever of this climate varies in its aspect and progress according to its mildness or severity, and according to the age, constitution, situation, and condition of the person affected with it. Hence the great variety of names that have been given to the disease: Synochus, Typhus, Adynamic fever, Nervous fever, Atactic fever, Jail fever, Malignant fever, Spotted fever, Putrid fever, Contagious fever.

As it is, perhaps, the least ambiguous, I shall adopt the term Continued fever, and treat of the disease under the heads of Mild Continued fever, Severe Continued fever, and Complicated Continued fever.

Mild Continued Fever.

This form of Continued fever, which is chiefly met with in children and young persons, usually commences with languor, lassitude, chilliness or shivering, pain or uneasiness in the head, loss of appetite, and a pale and dejected countenance. These symptoms are presently succeeded by heat and dryness of the skin, thirst, aching pains in the back and limbs, slightly hurried respiration, and some oppression at the præcordia. The tongue is red in its substance, and covered with a white mucus, which is most considerable towards the base; the urine is scanty, sometimes pale, more frequently high-coloured, and the bowels are generally more or less constipated.

The principal sources of complaint, are, the headache and pains in the limbs. The headache, however, although it may occasionally suffer some aggravation towards night, is very rarely attended with any intellectual disturbance beyond a slight confusion on first awaking from sleep, which even in this mild form of the disease, is for the most part disturbed and unrefreshing.

The disease of course exhibits varieties. Sometimes nausea or even vomiting occurs at an early period; whilst intense heat of the surface, although not uniformly present, may almost be said to constitute a peculiarity of mild fever in children.

Such mild cases of fever, even when neglected, will often terminate favourably in a week or ten days, and will very seldom be found to exceed that period, provided the patient have the advantage of a pure cool atmosphere and proper professional assistance. Much care, however, is required during convalescence, in order to prevent a relapse; for, so long as there remains any acceleration of the pulse,

thirst, or foulness of the tongue, extremely slight causes, such as premature excitement and irregularities in diet, often prove quite sufficient to reproduce the disease.

Another form of Mild Continued fever is that usually met with affecting adults, in whom we never fail to observe a strongly marked tendency of fever to assume a more severe character. Accordingly, on reaction taking place, there is at all times, *cæteris paribus*, much greater disturbance of the several functions than is observed in young subjects, whilst the disease itself is in almost every instance more protracted. It, however, varies in its mode of attack. Sometimes it makes its approach slowly and insidiously,—the individual experiencing a sense of bodily and mental languor, weariness, restlessness, chilliness, and loss of appetite, for some days previous to the development of any urgent symptom. At other times it makes its attack more abruptly, with sudden and considerable depression of strength and spirits, shivering, headache, aching of the limbs, extreme uneasiness and restlessness, complete anorexia, and much oppression at the præcordia.

These premonitory symptoms, whether tardy or abrupt, are presently succeeded by heat and dryness of the skin, and by pains in the head, loins, and limbs, which either now occur for the first time, or if they existed before, are felt in an aggravated degree, and are accompanied by an increase of the general uneasiness, with a consequent expression of distress in the countenance, highly characteristic of Continued fever: the pulse, which was before small and feeble, although perhaps accelerated, now becomes fuller, stronger, and rises to 100, 120, or even to 130 in a minute: the patient complains more or less of thirst and of dryness of the mouth; the tongue is com-

monly clammy, and coated with a light grey fur ; more rarely it is dry and parched, or glazed, of a yellowish red colour, or covered with a brown fur ; there is commonly pain experienced on pressing the epigastrium ; the bowels are for the most part constipated, and the urine is scanty, high-coloured, and of a strong smell, or it appears pale and inodorous ; the patient passes restless nights, has short, disturbed, and unrefreshing slumbers ; and in some instances has slight accessions of delirium during the night.

The symptoms enumerated usually proceed with little variation, and gradually subside, leaving the patient more or less emaciated. When properly managed, such cases will occasionally manifest convalescence so early as the tenth day,—more frequently about the fourteenth day, and perhaps most frequently of all about the end of the third week.

Severe Continued Fever.

The severe form of Continued fever may occur under very different circumstances. It may supervene suddenly in the progress of one of the milder forms already described, without any very manifest or assignable cause ; it may assume an inveterate character from the very commencement ; or, it may be induced at an indefinite period of a Mild fever by injurious treatment or bad management.

When symptoms indicative of severity unexpectedly supervene upon a more moderate kind of fever, they usually show themselves about the eighth, ninth, or tenth day, or perhaps later. The languor and debility become more apparent, the eyes appear dull, the countenance more shrunk, and expressive of distress ; the breathing becomes somewhat laborious, and the voice more feeble ; the tongue from being moist, gets dry and partially covered with a

brownish fur ; the skin is parched, though occasionally not particularly hot ; the pulse more frequent, with a slight sharpness in its beat, but at the same time more compressible, and the patient sinks into a more supine position.

These symptoms are speedily succeeded, or actually accompanied by a more manifest disturbance of the brain. This disturbance at first, probably consists merely in a slight degree of confusion on awaking from sleep ; the confusion, however, soon amounts to actual wandering, especially during the night, but continues in many instances even throughout the whole of the day.

In other instances the cerebral disturbance shows itself in the form of confusion, or a stupor from which the patient is with some difficulty roused, and into which he presently relapses. If we do rouse him, his answers to questions are short, and for the most part incoherent, and he will often continue muttering to himself, although no one is near.

It not unfrequently happens, that with a greater or less degree of this latter modification of cerebral disturbance, the patient will manifest more or less nervous agitation, almost amounting, in some instances, to tremor, especially when any one addresses him, or on attempting to make any exertion ; the tongue is sometimes morbidly red and clean, or polished, at other times dry and of a yellowish brown colour, and it will tremble when protruded. This state is also frequently attended with remarkable drowsiness and repeated flushings of one or both cheeks, sometimes with diarrhoea, sometimes with a tendency to constipation.

In the more excited, or in this low, drowsy, half-stupid, and agitated condition, patients will sometimes continue for two or three weeks or more, with little variation in the

general symptoms, and will either sink from sheer exhaustion, or gradually and slowly recover from a state of extreme debility and emaciation.

The unfavourable change, however, which now and then takes place in the progress of a mild form of fever, is sometimes of a more striking and much more formidable kind: the skin acquires a pungent and penetrating heat, the countenance gets flushed, the eyes ferrety red and restless, and the delirium more violent; the patient almost incessantly talking loudly, roaring, or swearing, night and day, but especially during the night. In this state he will occasionally manifest extreme restlessness, strive to get out of bed, and even use great violence towards those around him if they attempt to thwart his purpose. At other times the patient has intervals of greater quiet, will dwell upon divers topics in a wild incoherent manner, or he will, after intervals of slumbering, utter the most piteous cries, and will pick and pull about the bedclothes; the muscles are affected with subsultus, and the tongue trembles when the patient attempts to protrude it. Considerable difficulty, however, is often experienced in protruding the tongue in such a state of fever, for the teeth and lips become coated with a thick sticky black mucus, which seems in a manner to glue all the parts together. The tongue, indeed, is frequently so parched up that it seems to lie almost immoveable within the mouth, and is often covered with a thick brown or black fur which cracks and gives great pain to the patient. The black sticky mucus covering the lips and teeth extends to the fauces, and indeed, from the huskiness of the voice and teasing cough, one would be disposed to infer that it even reached the larynx

itself. In such severe cases, the urine is high-coloured, sometimes of a greenish or blackish tint from the presence of blood, and of an offensive odour. The bowels are sometimes confined, sometimes relaxed. When relaxed the stools are generally watery, dark-coloured, and offensive.

This aggravated form of fever sometimes, but very rarely, undergoes a sudden change for the better, on the breaking forth of an universal sweat, or on the supervention of an unusual discharge from the bowels. In a large majority, however, of such cases terminating favourably, the change takes place in a slow and gradual manner, without being preceded or accompanied by anything like a critical evacuation.

When, on the contrary, such cases prove fatal, the oppression of the several organs increases, the exhaustion of the vital powers becomes extreme, the urine and stools pass off involuntarily, and the patient lies supine and helpless in bed, muttering and insensible; whilst, in the worst cases, hæmorrhage of dark blood now takes place from the nose, from the bowels, or by urine, or blood is poured out by the cutaneous vessels, producing spots of a livid or purple colour, or marks resembling bruises, in which wretched plight the patient lingers till death terminates his sufferings.

Such are the forms which Severe Continued fever assumes when it supervenes unexpectedly during the progress of a milder sort; but, it not unfrequently happens that the disease manifests a bad and malignant character almost from the very commencement.

These constitute the second order of severe cases, and will for the most part be found connected, either with a bad

state of the patient's constitution, or with the unfavourable circumstances under which he happens to be placed, at the period of the attack.

If his constitution have previously been much impaired by the protracted operation of any debilitating cause, such as great anxiety or distress of mind, unwholesome or unnutritious food, or the abuse of ardent spirits, he will be peculiarly liable to the more malignant forms of fever; or, should the system be merely suffering from temporary exhaustion, induced by labour, want of rest, or venereal excesses, a similar result is likely to happen: there is, moreover, some reason for believing that a certain degree of excitement of the mind occasionally induces a state of body, in which all the symptoms are prone to run on with remarkable celerity and violence.

The third order of bad cases are those which are rendered so apparently by mismanagement, or by circumstances almost entirely independent of the state of the patient's constitution at the period of attack. They constitute by far the most frightful and aggravated forms of fever ever met with at the present day; they, alone, afford us the opportunity of witnessing examples of what the older writers designated Malignant, Spotted, and Putrid fever, and furnish us with ample proof, if further proof were wanting, that the fever of the present day is identical with the fever described by the older writers; that the mildest and most malignant are merely modifications of the same disease; and that they only differ in degree and not in kind.

It is when fever occurs in the confined habitations of the poor that we have such opportunities. Four, five, six, or perhaps more individuals are huddled together in one small ill-ventilated apartment, covered with rags and filth,

and probably deprived, not only of every comfort, but of the common necessities of life. Here it is that the contagion rapidly acquires force, so that every member of the family sooner or later becomes the subject of fever. When to this unfortunate state of things are added the too commonly prevailing error, of carefully excluding every breath of air, under an apprehension of catching cold; the practice of heaping on bedclothes; and the employment of spirits and other stimulating cordials to produce a sweat; then indeed we have presented to our view a picture of disease and wretchedness at once appalling and instructive. Three or four members of a family lying probably in the same bed, in different stages, or with different modifications of the same distemper, afford to the physician a most impressive and useful lesson; for whilst it proves to him the identity of the fever in all, it exhibits to him its ever-varying forms, and at the same time deeply impresses him with the incalculable importance of cleanliness and good ventilation. It is here that the mildest forms of fever are rendered malignant; it is here that such frightful havoc is made by the disease; and it is here that we may witness the Putrid fevers of old.

The close rooms and heating regimen, whilst they produce violent excitement, rapidly exhaust the strength of the patient. Delirium, coma, or stupor takes place early, the vital powers sink, the secretions run rapidly into decomposition, the urine and stools pass off involuntarily, the patient is covered with livid petechiæ or vibices, dark blood is passed by urine or stool, and he shortly expires, with all the symptoms formerly regarded as indicative of putridity.

Of course very considerable variety is observed in fever occurring under such circumstances, the malignity as

well as the rapidity of particular cases depending upon the constitution of the patient, and the extent to which the aggravating causes prevail. Yet with respect to constitution, the strong and robust suffer, comparatively speaking, more than the weak and delicate from these accumulated evils ; indeed, it is truly astonishing with what rapidity the disease runs on to irrecoverable malignity under such circumstances: the patient probably evinces intense excitement and raging delirium for a few days, but suddenly sinks into a state of the most extreme exhaustion, and dies with all the symptoms of fever in its most malignant form.

Complicated Continued Fever.

It has already been observed that the causes of fever act primarily on the nervous system, in consequence of which every organ and every function of the body appear to be more or less disordered. It has also been shown, that on reaction taking place, there is in every case of Idiopathic fever a certain degree of excitement set up, together with a remarkable tendency to congestion or to actual inflammation in certain important organs of the body, and that it is to this general disturbance and tendency that we must ascribe the infinite diversity met with in the character and aspect of the continued form of the disease. But although the disturbance set up affects more or less every organ and function of the body, it is nevertheless most striking as well as most perilous in the alimentary canal, brain, and lungs. In as much therefore as these organs are all more or less involved in every case of fever, as it is difficult to determine where mere excitement or congestion ends, and where actual inflammation begins, and as the severity or mildness of the fever seems to depend upon the greater or less degree of these several local derangements, it will

probably appear to some an abuse of terms, to speak of complicated continued fever, as consisting of fever combined with inflammation of these respective organs; whilst it may with some justice be argued, that severe continued fever and complicated continued fever are terms which virtually mean and express the same thing; fever, perhaps, only being severe in consequence of such complication. Since, however, some are disposed to doubt whether the severity of fever depends in every instance, either upon actual inflammation or any other casual local affection; and as it is desirable to point out those modifications of fever which are most obviously produced by a predominant affection of particular organs, we have deemed it right to adopt the division of fever we have done; only premising, that when we speak of fever as complicated with an affection of a particular organ, we would not be understood to mean that the organ specified ever entirely escapes in any case of fever; but merely, that in the case called complicated, it is affected in a predominant degree, or disproportionately to the other organs of the body.

Continued Fever with predominant Cerebral affection.

Either primarily or secondarily, we know the brain to be more or less affected in every case of fever, and that, varying in intensity, it is scarcely less manifest in the mild than in the severe; in the early, than in the later periods of the disorder. We are altogether unacquainted with the actual condition of the brain in the earlier stages of fever, and although more or less excitement of the organ always succeeds to reaction, we have no evidence that that excitement amounts to inflammation in every instance.

That inflammation of the organ or of its membranes does frequently occur, is proved, alike by the symptoms

during life and by dissection after death; but we are in possession of no positive or infallible tests by which to determine its existence or non-existence in every case: neither can we ascertain with precision how much of the cerebral disturbance results from the actual condition of the encephalon itself, and how much of it depends upon mere sympathy with other suffering organs.

Pain in the forehead or occiput, noise, confusion, giddiness, a sense of weight in the head, together with corresponding mental infirmity and even delirium, are symptoms, some of which are almost uniformly present in the early stages of every fever, and when moderate in degree, are such as neither bespeak serious organic change, nor portend danger. When, however, fever commences with intense pain in the head, and a slow or oppressed pulse, the disease is usually observed to prove exceedingly severe, and is often speedily fatal, unless the impending mischief be prevented by active treatment. This condition of the organ, if not inflammation, is one probably nearly approaching to that state, and is one which is known very frequently to prove the precursor of it.

The most decided marks of inflammation of the brain or its membranes, in fever, however, are commonly met with at an early period after reaction, in young adults of good constitution and full habit of body. They occasionally present themselves so early as the third or fourth day of fever, and consist of acute pain within the head, a wildness and suffusion of the eyes, intolerance of light and noise, extreme restlessness, violent delirium, a frequent sharp pulse, a dry, parched, and generally hot skin, and a dry and brown, more rarely a moist tongue.

If these symptoms be not promptly checked, the patient falls into a state of exhaustion; he lies prostrate in bed,

moaning, muttering, or uttering faint cries of distress, rolling about his head, picking the bedclothes, and when sufficient strength remains, manifesting a remarkable degree of jactitation. At length, the eyes roll about in their sockets, cold clammy sweats appear, the urine and stools pass off involuntarily, the pulse sinks, and death quickly follows.

Such cases usually run their favourable or unfavourable course in a very short time, and have by the vulgar been designated brain fever.

It is probable that the aggravation of symptoms which not unfrequently takes place about the eighth or tenth day of an ordinary mild fever, is owing, in many instances, to a corresponding, though less violent, inflammatory condition of the brain. The delirium indeed is less violent, but the great restlessness, the increase of languor and prostration, the dull expression of the eye, the feeble voice, the dry brown tongue, the frequent sharp pulse, and occasional starting of the tendons, sufficiently declare a state of brain which, if it be not actual inflammation, is one which is closely allied to it both in its nature and its consequences. Neither is it unlikely that in fever, as in idiopathic inflammation of the encephalon, the symptoms are different accordingly as the membranes, or the brain itself, happen to be principally involved; the violent excitement appertaining chiefly to the former, the more depressed condition to the latter.

The most common appearances found on dissection, when there has been predominant cerebral affection, are, minute injection of the pia mater; effusion, beneath the arachnoid, of a fluid which is commonly transparent and colourless, sometimes milky, more rarely yellowish or brownish from an admixture of albumen or blood; opacity and thicken-

ing of the arachnoid; effusion into the ventricles; great vascularity; occasionally softening, or less frequently hardening of the brain.

Continued Fever with predominant Abdominal Affection.

It is hardly necessary to repeat that the alimentary canal, in common with every other organ of the body, suffers derangement in the progress of every fever. This is sufficiently apparent in the injected state of the internal mouth, in the altered condition of the tongue, in the loss of appetite, and in the state of the alvine evacuations.

The nausea, vomiting, and pain on pressing the epigastrium, occasionally observed in fever, render it more than probable that the mucous membrane of the stomach may, in such cases, be the seat of actual inflammation, a supposition that has now and then been confirmed by dissection. But the affection of the alimentary canal, of by far the most frequent occurrence in fever, and that which most powerfully modifies its character, and enhances its severity, is unquestionably inflammation of the mucous membrane of the lower third of the ileum, tending to enlargement and ulceration of the solitary and aggregate glands.

It has indeed been insisted upon by some, that this peculiar condition of the ileum forms an essential part of one particular kind of contagious fever: they regard the disease as an exanthematous disease, and allege that, like an exanthematous disease, it runs a certain definite course. This, however, is rendered highly improbable by our finding the condition of the intestines to bear no uniform relation either to the period or severity of the fever; the affection of these organs sometimes being slight and little advanced at a late period, even of a severe fever, and *vice versâ*.

As a complication, it is of extremely frequent occurrence, and although sometimes obscure, may for the most part be recognised by the symptoms present.

When a patient at an early period of fever is affected with a diarrhoea, when there is pain in the abdomen, when the tongue is very red at the edges and furred in the centre, or when with morbid redness of its edges or of its whole substance it is morbidly clean or polished, little doubt can be entertained of his having fever complicated with inflammation of the mucous membrane of the ileum, and still less so if we find blood mixed with the discharges. But it very often happens that the whole of the above symptoms are absent, or very imperfectly developed, when the diagnosis is much more difficult. Nevertheless, even under these circumstances, there is pretty uniformly a something in the aspect of the patient, and in the general character of his symptoms, sufficient to apprise an attentive observer with tolerable certainty of the existing complication. However mild the case, there is usually a certain degree of nervousness, tremulousness, or agitation about the patient, sometimes almost amounting to subsultus, and especially manifest on attempting to make any exertion; he is dull and drowsy, with some tendency to stupor, but may nevertheless always be roused to understand and answer questions, even during the night when the mental aberration is most considerable; the eye is generally bright; the face is occasionally pale, but in the more severe cases, and especially when advanced, there is very commonly a circumscribed flush on one or both cheeks, appearing and disappearing repeatedly during the day. These flushes are at all times expressive of some increase of febrile excitement, and in many instances are associated with strongly marked

exacerbations, occurring frequently and irregularly, and very closely resembling the exacerbations of infantile remittent fever. As in infantile remittent fever, too, the patient now and then manifests extreme restlessness, and is observed to pick his lips, tongue, or cheeks, or to pull about the bedclothes. In aggravated cases, the irregular exacerbations and flushing of the cheeks often become very striking, and will continue with little variation from three to six weeks, or even longer. With these symptoms emaciation proceeds; and when the mesenteric glands get involved, as generally sooner or later happens in bad cases, the proper supply of chyle being thereby cut off, the patient rapidly wastes, notwithstanding the liberal supply of nourishment which he will sometimes take, the hips and sacrum ulcerate or slough, and at length the patient dies a perfect skeleton.

In milder cases which have a favourable termination, convalescence is almost always tedious and protracted, the bowels, although they may be to the last costive, being disposed to be violently acted upon by moderate medicines, and the patient remaining long in a state very susceptible of a relapse from any slight excess or imprudence in diet.

If with the state of the bowels just described the lungs happen to be unusually involved at the same time, the above symptoms generally become more striking, especially the exacerbations and flushing of the cheeks.

It is difficult to account for the presence of diarrhoea in some cases, and its total absence in others, when the intestines are inflamed or ulcerated; neither can we explain why it should so often appear at an early, and cease at a later period. We cannot, however, help entertaining a suspicion, that the diarrhoea is determined, in some mea-

sure, by the extent to which the cæcum and colon happen to be involved in the inflammatory process ; for, when diarrhœa does occur, the stools most certainly indicative of intestinal mischief are those which are watery, and have a small portion of ochre-coloured matter subsiding to the bottom of the containing vessel ; a discharge which probably owes its peculiar character to the increased action of the cæcum and colon, causing an excessive quantity of fluid to be poured out, and at the same time so hurrying onward the pale-coloured matter received from the small intestines, as to prevent the delay necessary for their conversion into genuine fæces.

With regard to the morbid appearances presented in fevers complicated with abdominal affection, the lining membrane and the mucous apparatus of the stomach and intestines generally show the most unequivocal marks of disease. But though all parts occasionally participate, the chief seat of derangement is found to be the last three feet of the ileum, and cæcum and colon. The diseased appearance sometimes consists merely of vascularity, more or less generally spread over the surface ; at other times the vascularity is determined to particular parts and patches, generally corresponding with the situation of the aggregate mucous glands or follicles ; and frequently there is an obvious turgescence in the glands, both aggregate and solitary. In advanced and severe cases the glands appear to have been most actively inflamed, running into a state of ulceration, so that many irregular ulcers of various extent may be traced from place to place through a large portion of the ileum. These ulcers are particularly frequent near to the ileo-cæcal valve, and in the colon itself are often largely distributed, and they vary in appearance according to the state of the disease and of the constitu-

tion. Sometimes they are covered with a slough, tinged by the feculent matter. Sometimes they offer a surface with unhealthy granulations, or almost of a fungous character. Sometimes they present clean excavations, with no part of the substance of the intestine remaining except the peritoneum. Sometimes we find them in various stages of reparation and cicatrization, and sometimes they have ulcerated or burst their way into the cavity of the abdomen; but when this is the case the peritoneum likewise shows marks of inflammation, either by vascularity or by some of the various products of inflammatory action. The glands of the mesentery and mesocolon are almost always more or less affected when ulceration has taken place in the mucous membrane; they become enlarged and vascular, and are sometimes found approaching to a state of suppuration. Other organs of the abdomen are occasionally affected, amongst which the spleen in particular is often softened and altered in its texture.

Whilst inflammation is confined to the mucous membrane of the intestines, there is seldom much pain, and often none at all, even upon pressure; hence it is, that whenever considerable tenderness prevails, we have reason to apprehend inflammation of the peritoneum. In examining the abdomen, however, it must be remembered, that in fever there is often such a degree of susceptibility of the whole surface, that patients will flinch from slight pressure made upon any part.

Peritoneal inflammation is, upon the whole, of very rare occurrence in fever, except it proceed from ulceration, begun in the mucous membrane, penetrating the other tunics of the intestines, and thus extending to the peritoneum. Such penetration, when it does happen, usually takes

place at an advanced period of the disease, or even during apparent convalescence, and is indicated by pain and tenderness, which is most frequently situated at the lower part of the abdomen, and towards the right side. When the peritoneum becomes thus involved, the most favourable, and fortunately the most common result is, adhesion between the peritoneum above the ulcerated spot, and some other portion of that membrane, by which effusion of the contents of the intestines into the general cavity of the abdomen is prevented. It nevertheless sometimes happens that such adhesion does not take place, and effusion is the consequence. This event is speedily followed by violent inflammation, rapidly extending over the whole of the belly, and attended with incessant sickness, a frequent contracted pulse, hurried respiration, a cadaverous aspect of the countenance, cold clammy sweats, extreme prostration, followed by death, usually in from twelve to forty-eight hours.

Continued Fever, with predominant Thoracic Affection.

This thoracic affection may be seated in the bronchia, in the pleura, or in the air-cells; or it may involve more than one of these at the same time.

In attempting, however, to appreciate these several thoracic complications, it must be carefully borne in mind, that in most cases of fever, especially when severe, there usually prevails some anxiety and hurry of respiration, independently of any serious inflammatory affection whatever.

Bronchia.—In every case of fever, the bronchial secretion appears to deviate more or less from its natural state. This is only what might be expected, and may readily be recognised by auscultation, the hissing and sonorous

rattles being in general distinctly audible. Occasionally, however, and especially in winter and spring, this bronchial affection is much more considerable, and amounts to a variable degree of decided bronchitis, indicated by increased hurry of respiration, slight lividity of countenance, cough and expectoration, and by the ordinary auscultatory signs of that complaint.

Pleura.—Inflammation of the pleura is commonly indicated by a stitch in the side, and by shortness or catching of the breath. The patient suffers most from it when associated with bronchitis, in consequence of the cough occasioned by the latter; whilst, on the other hand, in severe cases of fever, attended with impaired sensibility and intelligence, it often exists in a latent state, and is only to be detected by the careful employment of auscultation.

Pneumonia.—When inflammation attacks the air-cells, pneumonia is the result; a complication at all times of serious moment, not only from its proving a cause of obstruction to the functions of the lungs, but in consequence of the disorder which it reflects back upon the brain, and the great tendency to congestion which it occasions in all the important organs of the body. It may give rise to flushing of the face, hurried respiration, and slight characteristic expectoration; but it must be confessed, that of all the ordinary inflammatory complications in fever, this is the most obscure, and when unattended with bronchitis, very commonly remains altogether latent, there being neither cough nor expectoration, nor any considerable oppression of the breathing. It is often by auscultation alone, therefore, that it can be detected in many instances; a proceeding which ought never, on any account, to be omitted in any case of fever.

The morbid appearances found in the bodies of persons who die of fever complicated with predominant thoracic affection, do not differ from those produced by idiopathic inflammation of the respective structures, and need not therefore be detailed in this place.

Although we have thus pointed out separately the symptoms which usually indicate the presence of these complications, it very rarely, or perhaps never happens, that these symptoms are not modified by greater or less degrees of disturbance existing in several organs at the same time; compound complications which, when severe, give rise to the most aggravated and too often hopeless forms of fever.

Petechiæ.

This term has been applied indiscriminately and improperly to two conditions of the surface occurring in fever, which, although occasionally combined, are essentially very different, the one being a mere exanthema or efflorescence, the other a true ecchymosis.

The efflorescence is by no means of unfrequent occurrence, and does not imply any remarkable severity or malignity. It most commonly appears a few days after reaction has been fully established, most abundantly over the trunk of the body, and may last three or four or more days. It is of a pale red colour, producing a mottling of the surface, very closely resembling that of measles on the decline.

Petechiæ, more strictly so called, are true ecchymoses, and arise from minute effusions of blood beneath the cuticle. They are most frequently of a pale red colour; sometimes, however, dingy, livid, or purple. In form and magnitude they usually resemble very much ordinary flea-bites; but nevertheless vary in size, from that of a pin's

point to that of a split pea; they occur on all parts of the body except the face, and generally appear and disappear without any regular or determinate order. They have commonly been regarded as indicative of malignity and danger; but in this respect much depends upon concomitant circumstances. When they are of small size, of a pale colour, and unaccompanied by other symptoms of an unfavourable kind, they are of little consequence, and neither imply great prostration nor portend danger. When, however, they are of a dingy, livid, or purple colour, and of large size, or attended with the larger ecchymoses, called vibices, they number amongst the very worst symptoms of fever, there usually prevailing at the same time remarkable prostration of the vital powers, and great oppression of important organs, together with a disposition to hæmorrhage from the mucous membranes of the alimentary, respiratory, and urinary passages.

Petechiæ are to be distinguished from flea-bites by the central puncture, discoverable at an early period of the latter, on drawing the finger firmly over their surface.

As occasional, though comparatively rare, complications of fever, we may enumerate Erythema, Erysipelas, Herpes labialis, Miliary Rash, Boils, and Inflammation or even Suppuration of the Parotid, Submaxillary, or Lymphatic glands.

Predisposing and exciting Causes of Continued Fever.

Continued fever not unfrequently assails a person without our being able to trace it to any ostensible cause whatever. When obvious, the most common predisposing causes are such as reduce the strength or impair the general powers of the system:—previous disease, anxiety or distress of mind, residence in unwholesome

localities or ill-ventilated apartments, scanty and bad nourishment; also temporary exhaustion, whether arising from over-exertion, long watching, fear, cold, diarrhoea, or excessive venery; and, lastly, epidemic influence.

Some of these causes, however, usually accounted predisposing, seem capable, by long-continued application, of actually inducing fever; whence probably, the frequent and extensive prevalence of fever in times of scarcity or famine, and especially in the filthy and crowded habitations of the poor. It is at these times, and in these situations too, that contagion, the most distinct exciting cause of fever, is either generated, or, when introduced, acquires its greatest virulence.

Diagnosis of Continued Fever.

It is generally supposed that the diagnosis of a common Continued fever is without difficulty; and unquestionably, in a very large proportion of cases it is so. The previous condition and circumstances of the individual, the mode of attack, the remarkable loss of strength, the anxious or distressed expression of countenance, the vivid injection of the substance of the tongue, together with the absence of any obvious local inflammation sufficient to account for the febrile state, will seldom leave any doubt as to the nature of the disease. It is nevertheless true, that the diagnosis is by no means at all times so very obvious, and that mistakes sometimes are made which prove highly detrimental to the patient.

The principal source of fallacy, is some obscure local inflammation, of which the febrile symptoms may be a mere effect or consequence. Latent suppuration, chronic inflammation of the mucous membrane of the stomach or bowels, dysenteric disease of the colon, chronic perito-

nit, disease of the mesenteric glands, and diabetes, have all occasionally given rise to a moderate but persisting febrile state, which has been mistaken for a mild Continued fever; whilst the symptoms which attend acute idiopathic inflammation when set up in certain organs, and especially in the aged, and in persons of bad constitutions, sometimes so closely resemble those of common fever, as not unfrequently to mislead even the most experienced. The acute inflammation, however, which most frequently leads to the mistake, both in the old and young, in good and in bad constitutions, is idiopathic pneumonia, a disease, the reputed symptoms of which very often fail to be developed. Auscultation, therefore, is indispensable.

Inflammation of a vein, poisoned wounds, and latent suppuration about the perinæum or neck of the bladder, occasionally produce symptoms resembling those of Continued fever.

Prognosis of Continued Fever.

As we know that unfavourable symptoms may unexpectedly supervene upon the mildest fever, an extremely cautious prognosis ought to be given in every instance, as to the ultimate result; and although the saying, "Whilst there is life there is hope," applies in a peculiar manner to fever, it is equally true that whilst there is fever there is danger.

Mild Continued fever, attacking children and young persons, under the favourable circumstances of good ventilation and judicious treatment, ought seldom to give rise to any serious apprehension concerning the result;—such cases, as already observed, usually terminating favourably in eight or ten days; and even when this mild form attacks adults, although almost of course more

severe, it seldom proves fatal. In every case the general debility is considerable, but is of little consequence unless accompanied by other bad symptoms.

Amongst the most favourable signs, are, a mild equable warmth and moisture of the skin, easy respiration, a soft and moderately frequent pulse, with little disturbance of the brain, and without serious irritation in any particular organ. The most striking, as well as the most common indications of amendment, are, the debility and dejection becoming less apparent, the voice more distinct and natural, the skin more moist and pliant, the pulse softer and fuller, the restlessness diminishing with a disposition to refreshing sleep, the signs of disturbance of the brain gradually subsiding, with corresponding recovery of the intellect, the tongue changing from dry to moist, usually first observable about the edges, or the thick black crust beginning to break and fall off, discovering the parts beneath soft and moist; and lastly, a moderate bilious diarrhœa.

When any of these symptoms appear, they usually portend a favourable change, especially if several of them are observed to happen about the same time; and, generally speaking, so long as the pulse continues firm and the respiration free, we ought not to despair; nor so long as the pulse is rapid, ranging, perhaps, between 110 and 130 in a minute, and especially if with a sharpness in its beat, ought we to be without apprehension of danger.

The bad symptoms are, extreme debility, so that the patient sinks to the bottom of the bed, feebleness of the voice, difficult deglutition, a partial clammy sweat, damp coldness of the body, black, parched and chapped tongue, hurried respiration, a quick frequent sharp pulse, obsti-

nate delirium, coma or muttering, with rolling of the head, extreme restlessness, picking of the bedclothes or subsultus tendinum, dark livid or purple petechiæ or vibices, hæmorrhage of dark blood from the bowels, by urine, or from the nose. When the pulse sinks, becoming creeping and thready, when the extremities get cold, the countenance cadaverous, and the urine and stools pass off involuntarily, death soon closes the scene.

Treatment of Mild Continued Fever.

We know from experience that when Continued fever is allowed to proceed uninterruptedly, it has a tendency to run a certain course,—to reach its height and then to decline; we also know that if called at a very early period, the physician can occasionally by prompt measures cut short the disease at once, but that after a certain time this power is denied to him and the fever must run its course.

Since we possess no remedy therefore capable of curing, or rather, which proves a specific for fever, it follows from the above-named positions that in the treatment of the disease two indications present themselves:—to cut short the fever if possible at once; and—if this be no longer in our power,—to conduct our patient safely to the natural and spontaneous termination of the disorder.

To cut short the disease, nothing has been found so effectual as a brisk emetic, given any time before the stage of excitement is fully established. A scruple of ipecacuanha with or without a grain of antimonium tartarizatum, administered on the first, second, third, or even fourth day of indisposition, will occasionally succeed in completely arresting the disorder; the patient probably after its operation falling into a quiet sleep, a gentle moisture break-

ing forth over the whole surface, the circulation becoming equable, the pulse more firm and steady, and very little beyond a slight feeling of weakness being complained of afterwards. A brisk purge has now and then appeared to answer a similar purpose, but is less efficient. It is preferable therefore to follow up the emetic by a purge of calomel and rhubarb, or of calomel and jalap; a practice which, even if unsuccessful in entirely arresting the disorder, will often very materially tend to obviate its subsequent violence.

After the first stage of fever has passed, and excitement is fully established, we still occasionally have it in our power to break the violence and shorten the duration of the disorder by blood-letting or by the affusion of cold water over the surface of the body.

A very large proportion of cases of simple continued fever will do exceedingly well without any blood-letting whatever, whilst under the most favourable circumstances it is chiefly in the first or about the beginning of the second week that we are justified in employing it to any considerable extent. In robust subjects, at this early period, especially if we have the advantage of good ventilation, a free venesection will often have the effect of speedily diminishing the hardness and frequency of the pulse, reducing the heat of the surface and thereby promoting perspiration; the face, probably red and flushed before, becoming more natural, the pains in the head and limbs subsiding, the patient expressing himself universally relieved, and the disease passing through the remainder of its short duration without exciting the least apprehension.

The quantity of blood to be taken must of course be regulated by the constitution of the patient, and to a certain extent by the tendency of the prevailing epidemic influ-

ence, but about 12 or 16 ounces will be a fair medium quantity for an adult. Should the symptoms of excitement again increase in a considerable degree, as indicated by the pulse, heat of skin, and pain in the head, we may venture to repeat the bleeding on the following day to a similar or somewhat less extent; but it will rarely be judicious or safe to carry depletion beyond this, unless very particular circumstances demand it.

The cold affusion has also been recommended to arrest, or to break the violence of fever after reaction. The remedy however appears so harsh, that it is not at all times easy to prevail either upon the patient or the patient's friends to consent to its application. Neither is the heat in general such as very urgently to demand it. In cases therefore where the heat and dryness of the skin are considerable, cold sponging either with water or with equal parts of vinegar and water may be substituted with propriety and advantage; the sponging being repeated as often as the state of the surface shall appear to require it. By thus carrying off the morbid heat, the skin becomes less tense and occasionally manifests a disposition to perspiration, the general restlessness is relieved, and the patient enjoys greater repose.

The rest of the treatment of this mild form of fever is extremely simple. As a general medicine some give the common saline julep of citrate of potash three or four times a day; others, two or three drams of the liquor ammoniæ acetat. in distilled water with a little syrup of orange-peel, and occasionally a few minims of spt. æther nitrici. When considerable heat and thirst prevail and the state of the bowels permits, some recommend the compound infusion of roses as a common drink; but upon the whole, our favourite medicine at present in all the ordinary forms of

Continued fever is the bicarbonate of soda, given to adults in doses of from 15 to 20 grains, three times a day. Perhaps the most agreeable form of it, is a solution in simple distilled water, made palatable by the addition of half a drachm or a drachm of syrup of orange-peel.

One of the principal objects in conducting a case of fever, is unquestionably to free the *primæ viæ* from irritation, and to promote the secretions there by the occasional exhibition of a gentle purge. One or two evacuations should be procured daily, and as they are for the most part unnatural in appearance, we generally prefer a mercurial purge to any other. Three, four, or five grains of calomel, with ten or twelve of rhubarb or of jalap, answer very well, or a saline purge with manna, or compound infusion of senna, may now and then be substituted.

Under this very simple treatment, with good ventilation and the strict antiphlogistic regimen, patients will very generally proceed with safety to the termination of this milder form of fever,—in young subjects about the tenth or twelfth day, and in adults probably about the end of the third week, without any marked crisis.

Throughout the entire progress of the disorder the patient's apartment ought to be kept, rather cool than absolutely cold; and in order to secure good ventilation a small fire ought to be kept up, at least occasionally, in the day-time. In winter, the windows may be opened at intervals during the day; and in summer, both the windows and door may be permitted to remain open. The patient's bed ought to be divested of curtains, only retaining such as may be necessary to prevent exposure to currents of air. The bedclothes should be light, and it is advisable to place a wool or hair mattress above the featherbed, in order that the heat may not be allowed to accumulate.

The patient's drink may consist of good barley-water flavoured with fresh lemon-peel and moderately sweetened, toast-water, or what is often preferred, plain water as drawn from the spring.

The food ought to consist of articles of the lightest and simplest kind. All solid food must be withdrawn; the stomach cannot digest it, and it produces irritation. Even animal broths or jellies are unnecessary, and often hurtful. Half a breakfast-cup full of water-gruel, sago, or arrow-root given four or five times a day will be quite sufficient. At the same time, provided the bowels are not irritable, oranges and the sweet subacid fruits if in season may be taken with impunity and often with advantage. But in the employment of these much caution should be used.

Mercury.

This remarkable drug displays so much power in subduing the violence of fever, provided the system can be brought under its influence, that some persons have almost regarded it in the light of a specific. It is indeed true that when the mercurial action can be fully established in fever, the disease pretty uniformly proves of short duration and thenceforth free from danger. But as it is at all times extremely difficult and often impossible to affect the system with mercury in bad cases of fever, the fact just stated probably rather argues that the mildness of the particular case permitted the usual operation of the remedy, than that the remedy controlled the fever.

Nevertheless, mercury is not only a powerful, but when employed with discretion, a most valuable agent in fever. Its great utility as a purge is indisputable, whilst its extraordinary power in preventing or arresting inflammation

points it out as peculiarly applicable to fever, and especially to its severer forms ; such severe cases probably, in most instances, owing their severity to inflammation, or to something very nearly approaching that state, set up in important organs. Hence it is, that in all severe fevers, provided the state of the alimentary canal will admit of its administration, mercury may be employed, but, of course, variously combined according to the particular circumstances of the individual case.

Should it be very desirable to give mercury freely, notwithstanding an irritable condition of the bowels, the hydragryrum c. cretâ, either with additional chalk or with chalk and opium, will sometimes answer the purpose ; and should neither opiates, absorbents, nor astringents succeed in enabling the bowels to bear the mercury in sufficient quantity, mercurial inunction may be had recourse to—a drachm or two of the strong mercurial ointment being rubbed into the extremities, or applied to the axillæ twice or thrice a day.

Treatment of Severe Continued Fever.

The aggravation of the symptoms of fever, as already observed, takes place, for the most part, about the eighth, tenth, or twelfth day, and is generally first indicated by the state of the intellect, by the pulse, by the tongue, and by the loss of muscular power. When at this period, active delirium supervenes, so that the patient becomes violent, talks incessantly, and attempts to get out of bed ; when the tongue becomes dry and brown, the pulse frequent and sharp, with a dry parched skin, some form or other of depletion must be attempted ; for if not, and especially if cordials be given, the patient will soon pass into a state of

stupor, low muttering, with subsultus tendinum, and will assuredly die. And even if instead of this excited state we have merely confusion or stupor, we must pursue a somewhat similar course. We would not bleed so freely as at an earlier period, but six, eight, or ten ounces of blood may occasionally be taken from an adult, with decided advantage; the powers of the system speedily rallying after the operation, the delirium subsiding, and the pulse losing its sharpness and becoming more soft and fluent.

Another valuable remedy under such circumstances, is cold applied to the shaven scalp. For this purpose, a piece of linen rag once folded, may be dipped in some evaporating lotion, applied to the head, and frequently repeated. Equal parts of vinegar and water, or of liquor ammon. acetatis and mist. camphoræ may be used, to a pint of either of which compounds, half an ounce of sulphuric ether may be added, to promote evaporation and thereby increase the cold. The assiduous application of cold in this way will often speedily allay irritation of the brain and dispose to sleep. In other instances, a blister to the nape of the neck will be found of considerable service.

The next important part of the treatment in severe fever, is attention to the state of the bowels; and experience has shown that if the unfavourable change be associated with constipation, the mercurial purges ought to be preferred. We have known four or five grains of blue pill given every hour for three hours, and if necessary followed by half an ounce of castor oil, produce a most beneficial effect; the general uneasiness being greatly relieved, the tongue getting moist, and the skin relaxing almost immediately after the operation. In other cases, the rhubarb and calomel may be given, or the hydrargyrum c. cretâ, followed by castor oil.

Should the fever have proceeded to about the end of the third week before unfavourable symptoms supervene, the case becomes much more alarming and difficult; for with the exhaustion necessarily incident to this more advanced period of the disorder, we have nevertheless symptoms which at all times require something analogous to depletion, and are uniformly aggravated by a contrary practice. The increase of languor, the supine and helpless position of the patient, the muttering, the faint cries of distress, the starting of the tendons, picking of the bedclothes, the dull sunken eyes, black, chapped, and dry tongue, parched skin, perhaps livid petechiæ, involuntary stools and rapid compressible but still sharp and wiry pulse, indicate a state, if not of actual inflammation, at least of irritation in important organs, which never fails to be aggravated by tonics and stimulants. And indeed it may safely be asserted, that so long as there is a sharpness and smartness in the beat of the pulse, however small and contracted it may be, so long as the skin remains tense and dry, and the tongue dry, parched, and black, tonics and stimulants will almost uniformly be found to prove injurious. Under such circumstances, therefore, a few leeches to the temples, cold lotions to the shaven scalp, or a blister to the nape of the neck, will constitute the principal means that at this period we can recommend for the relief of the brain; whilst here again, special attention must be directed to the state of the bowels.

Whether these unfavourable symptoms occur early or late, provided it do not greatly irritate the intestines, calomel or some other form of mercury may be given with safety and often with the most marked advantage. A grain of calomel or four grains of hydrarg. c. cretâ may be given three or four times a day, at the same time employing the

bicarbonate of soda mixture as a general medicine. Should the bowels be irritable or relaxed, our first care must be to remove all offending matters by a little powdered rhubarb, or by a few grains of hyd. c. cretâ, followed by a couple of drachms of castor oil, and afterwards endeavour to protect them by combining opium or chalk, or both, with the mercury. Three grains of hyd. c. cretâ may be taken three times a day, with an ounce of chalk mixture, to which occasionally may be added a few minims of laudanum, or six or ten grains of confect. opii. In some instances the astringents kino and catechu have been successful in preventing the mercury from running off from the bowels, whilst in extreme cases the mercurial inunction has been tried. In every continued fever, however, attended with severe bowel irritation, unless the state of other organs urgently demand it, it will be prudent to abstain from the active use of mercury internally; a caution the more necessary since there is good reason for believing that much of the cerebral disturbance supposed to indicate its use, results secondarily from sympathy with the diseased intestines.

If, after having carried into effect all necessary depletion and counterirritation, and clearing the bowels of offending matters, there should obstinately remain a good deal of cerebral disturbance and restlessness, with a moderately soft pulse and loose skin, considerable relief will sometimes result from small and frequent doses of opium. For this purpose eight or ten minims of laudanum, black drop, or liquor opii sedativus may be given with from fifteen to thirty minims of vin. ant. tart. in any simple vehicle every two, three, or four hours; the repetition and continuance of the practice being regulated by the effect.

If notwithstanding the means recommended, the powers of life begin to fail, there is no alternative but to have re-

course to additional support, to stimulants and tonics, of which it may be stated generally, that in proportion as the skin becomes pliant or moist, the pulse soft and fluent, and the tongue moist, they may be exhibited with freedom, safety, and advantage. The least equivocal of all our stimulants under such circumstances is unquestionably the sesquicarbonate of ammonia. It seems to rouse the energies of the system without producing that disturbance of the brain which is liable to result from the use of vinous liquors. Five or six grains of it may be given in camphor mixture or any simple vehicle every three or four hours; or it may be administered in an ounce or ounce and half of an infusion of serpentary, made in the proportion of an ounce of the chopped root to a pint of water, and rendered more grateful by a little aromatic tincture. It is much preferable to the cinchona, which seldom fails to prove pernicious in almost every stage of common continued fever. These, with the addition of beef tea to the former diet, must be chiefly relied upon when great prostration prevails at an advanced period of severe fever. Nevertheless, occasionally a moderate allowance of wine will at the same time be found necessary. The quantity may vary from three to eight or ten ounces in the course of twenty-four hours. It should be slightly diluted, and exhibited in portions of about an ounce every two, three, or four hours according to the effects produced.

When the sinking of the vital powers is such as to call for the more powerful stimulants, brandy and ether, the case must be looked upon as all but hopeless;—hopeless, because the exhaustion is then for the most part associated with great irritation or actual inflammation of important organs; disturbances which are too often aggravated by all tonics and stimulants.

When fever attacks persons advanced in life, a sudden and rapid state of collapse not unfrequently takes place, at a comparatively early period of the disease. This is more especially the lot of those who have previously been given to dram-drinking, and is characterized by a sense of faintness and sinking, laborious respiration, a cool or cold damp and relaxed skin, a frequent, small and feeble pulse, and a more or less moist but loaded tongue. Patients in this state are only to be saved by the immediate and assiduous employment of cordials and support;—by wine or small quantities of brandy or gin very little diluted, by ether and ammonia, and beef tea at short intervals, until reaction is established, when they must be gradually withdrawn.

At a very advanced stage of most severe fevers, the patient occasionally manifests considerable prostration, as indicated by his supine position, by a frequent feeble but soft pulse, and by moderate heat of surface, together with a state of brain producing great restlessness or even delirium and starting of the tendons,—a state of brain, however, accompanied rather by paleness than by suffusion of the face, and in short without any indication whatever of phrenitic irritation. The pale face, the moderately warm or cool surface, the supine position, and the frequent but soft and compressible pulse, constitute our best guides in such cases, and point out the necessity of rousing and supporting the powers of life, both by medicine and by diet if it can be taken. Musk, camphor, ammonia, wine, porter, small doses of laudanum, ether, or even diluted spirits, have all in turn been given with advantage under such circumstances.

Treatment of Complicated Continued Fever.

Before proceeding to point out the treatment applicable to the more decided inflammatory complications of fever, it must be observed generally, that although these inflammations are to be treated on common principles, it must never be forgotten that along with the inflammation we have to contend with a fever which is at all times of uncertain duration, and which never fails to impair more or less the vital powers of the system; and consequently, that in adopting depletory measures, we must employ them with extreme caution and with a sparing hand.

Treatment of Continued Fever with Predominant Cerebral Affection.

When in the progress of a mild fever, a comparatively sudden aggravation takes place, it is probable that in a majority of instances at least, the aggravation is owing to some additional excitement, if not to an actually inflamed state of the brain or its membranes; and the treatment must be such as has already been pointed out under the head of Severe Typhus. In this place, it is only necessary to remark upon that early and intense affection of the brain in fever, to which the name of brain fever has been applied, and which most frequently occurs in persons of naturally good constitution.

In this state the patient should be freely bled from the arm, and have the operation repeated according to the effect produced. If we entertain any doubt about carrying general blood-letting further, the local application of cupping-glasses to the nape of the neck, or leeches to the temples, may be had recourse to. The patient's head should be

shaved and kept cold by evaporating lotions; or a stream of cold water may be poured upon it from a height: the bowels must be freely opened; all light and noise excluded, and the patient kept upon slops. If there be no irritation of the bowels, calomel may be given to the extent of two or three grains every four or six hours; and should it induce diarrhœa it may be guarded by chalk mixture, but opium is scarcely ever admissible.

It is more especially in this form of fever that the patient is apt to become so violent and ungovernable that it is necessary to restrain him by means of the strait-waistcoat; a proceeding, however, which ought never to be adopted, provided the safety of the patient and of his attendants can be secured by more gentle means.

*Treatment of Continued Fever with Predominant
Abdominal Affection.*

Occasionally at some period even of a mild fever a vomiting supervenes, harassing and exhausting the strength of the patient. The vomiting is now and then attended with tenderness at the pit of the stomach, when six, eight, or ten leeches, followed by a poultice or a blister, may be applied, with relief. The pain however is by no means constant, the sickness appearing to arise solely from an irritable condition of the stomach. In this case, the effervescing draught, or what often succeeds much better, eight or ten grains of magnesia in an ounce of some aromatic distilled water, with three or four minims of vinum opii, may be given from time to time according to the effect produced. In other instances a mustard poultice to the scrobiculus cordis will quickly put a stop to the vomiting.

When fever is complicated with bowel affection, general blood-letting rarely proves either necessary or effective, unless indeed there be considerable power of constitution, and violent inflammatory symptoms prevail at a very early period. Under such circumstances, one moderate general blood-letting may be of service. In a majority of instances, however, ten, twelve, or fifteen leeches to the belly, followed by fomentations or poultices, will answer every useful purpose of depletion; or should all depletion be deemed unnecessary, the fomentations and poultices may be employed alone.

When the discharges are of unhealthy appearance and are attended with flatulency, distension, griping, and tenesmus, it is at all times desirable to evacuate the vitiated contents of the bowels in the first instance by some mild laxative, such as a couple of drams of castor oil, ten or twelve grains of powdered rhubarb, or an emollient glyster of gruel, barley-water, or very thin starch. Having accomplished this, excessive purging must be restrained by the cautious application of absorbents and opiates. The chalk mixture, with or without a few minims of laudanum, may be given three or four times a day; or, together with the chalk mixture, from six to ten grains of the *confectio opii* in the form of bolus, or four grains of Dover's powder as a pill, may be taken twice a day. In some instances the bowels may be soothed and quieted by the injection into the rectum of half a pint or even a pint of warm barley-water, to which may be added occasionally half an ounce or an ounce of syrup. *papaveris* or twenty or thirty minims of laudanum. In other cases the opiate may be thrown up with three or four ounces of thin starch, in order that being less bulky it may more certainly be retained for a longer period.

When the affection of the ileum is unattended with diarrhœa, or when the diarrhœa after a time has ceased, as often happens, no particular treatment is called for, care only being taken to maintain a moderate discharge from the bowels by the mildest laxatives, such as a couple of drachms of castor oil with four or five minims of laudanum, preceded or not by two or three grains of hyd. c. cretâ.

Mercurials, and especially calomel as a general remedy, are very rarely admissible. When given with a view to correct the secretions, upon the supposition that the irritation of the intestines depends solely upon their presence, they almost uniformly do harm; they for the most part aggravate the diarrhœa, and not unfrequently produce bloody stools and the death of the patient. If deemed indispensable therefore either to correct the vitiated condition of the discharges, or to arrest some local inflammation, the mercury must be well guarded by chalk or opium, or both, as has been already pointed out.

It is ulceration of the mucous membrane of the intestines, which, in a large majority of instances, gives rise to those tedious and protracted cases of fever going on to extreme emaciation, and ultimately to excoriation, ulceration, and sloughing of the sacrum and hips. After the more active stages of this form of the disorder are passed, therefore, we must, notwithstanding the febrile exacerbations so commonly attendant, endeavour to support the strength of the patient by nourishment and tonic medicines. Beef tea, sago, wine, arrowroot, yolk of egg beat up with sherry and sweetened with sugar, regulated in quantity by the effect and by the condition of the patient, must be allowed. Occasional doses also of the sesquicarbonate of ammonia may be given when there is much faintness; and

as tonics, the serpentary and sulphate of quinine may be tried, although it must be confessed that they now and then produce too much excitement to admit of their liberal employment.

The best mode of guarding against the effects of pressure, and thereby preventing ulceration of the sacrum and hips, is to place the patient on the water-bed invented by Dr. Arnot; or if this cannot be procured, so to support the patient by pillows as to take off the pressure. Indeed, whenever the case proves tedious, we ought, as a matter of precaution, to defend the parts liable to suffer, by the application of common lead or soap plaster. If excoriation should have taken place, the parts after being washed with tepid milk and water, may be gently bathed with equal parts of brandy and water or laudanum and water, and then either be left uncovered that they may scab over, or be covered with a little lint and zinc or saturnine ointment. When there is a disposition to slough, a lotion consisting of half a drachm or more of strong nitric acid and a pint of distilled water, or the black wash poultice may be tried. In some instances much good has appeared to result from the application of a linseed-meal poultice, sprinkled over with finely powdered cinchona bark.

Peritonitis in fever, unconnected with ulcerated bowels, is of extremely rare occurrence. When therefore at a more or less advanced period of fever, local tenderness indicates its presence, it in all probability results from the extension of disease from the mucous to the serous membrane, and must be, moderated at least, by leeches, poultices, and fomentations; but at the same time the greatest care must be taken not unnecessarily to disturb or press the abdomen, as this has been sometimes known to inter-

rupt the adhesive process by which the extension of the mischief would have been prevented, and has even been the immediate cause of the intestines giving way.

When effusion of the contents of the bowels takes place into the general cavity of the abdomen, the case is beyond the reach of art, and death almost inevitably and speedily follows.

*Treatment of Continued Fever, with Predominant
Thoracic Affection.*

Bronchitis occurring in fever, like the other inflammatory complications, is to be treated with a degree of activity proportionate to the age and constitution of the patient, and the period and severity of the original disorder. If it occur early and in young persons of good constitution, a moderate general blood-letting may occasionally be beneficial; but if general blood-letting to any considerable extent be an ambiguous remedy, even in idiopathic bronchitis, it is a practice which requires much more scrupulous caution in fever. In truth, it is rarely admissible; local depletion by cupping or leeching, or the application of a blister being much more safe and often sufficiently effective. Mucilaginous and demulcent medicines may be employed at the same time, with a few minims of vin. ipecacuanhæ or vin. ammonii tartarizati, and a mild anodyne, such as tinct. hyoscyami, every four or six hours.

In very severe bronchial complication, when the constitution is good, and when the state of the bowels will permit, calomel sometimes proves of great value. A grain, with a quarter of a grain of ant. tartarizat., or a grain of ipecacuanha, or three or four of pulv. ipecac. co. may be given three or four times a day. In other instances the antimonial treatment applied by Laennec to pneumonia may be tried.

If *Pneumonia* supervene, precisely similar practice will be applicable, any apprehension of over-depletion being considerably less than in severe bronchitis.

Pleurisy will be most successfully combated by moderate general or local depletion, and by blistering, together with calomel administered as pointed out above.

It has already been observed that several of these complications occasionally concur, and in an aggravated degree, in the same case of fever. Such appalling forms of the disease are most frequently met with in the dirty and ill-ventilated hovels of the poor. It is then that, along with extreme oppression of important organs, the vital powers are rapidly exhausted, the blood and its secretions become vitiated, and, that degree of vital influence naturally imparted to them being withdrawn, the blood flows from its vessels in the form of dark hæmorrhage or of livid or purple petechiæ or vibices, whilst the secreted fluids from the same cause, rapidly undergo decomposition and run into a putrid state.

It is under such extreme circumstances that not only the most powerful stimulants and tonics, but, with a view to correct the putrid tendency of the secretions, the mineral acids and yeast have been recommended; the latter in a dose of an ounce three or four times a day by the mouth, or exhibited to twice or thrice that amount from time to time as a glyster.

Such cases, however, are all but hopeless: the best practice will consist in securing good air; in endeavouring to remove as far as possible the various sources of irritation existing in the head, chest, and abdomen; in supplying as much nourishment as the patient can be prevailed upon to take; and in freely administering the milder stimulants and tonic remedies already recommended in the severe forms of simple fever.

Every case of Continued fever ought to be seen daily, and sometimes twice a day. At each visit the state of the patient's bed, the ventilation of his apartment, and the condition of his several organs, secretions, and excretions should be most attentively investigated.

It not unfrequently happens in the course of the disorder, that from the insensibility of the patient, the bladder becomes over distended, and at length incapable of emptying itself. This is apt to give rise to a peculiar restlessness or moaning, with a sort of incoherency, or a disposition to coma, and unquestionably very much enhances the danger of the patient. It is very commonly attended with a more or less constant dribbling of urine, which betrays the attendant into a belief that it is sufficiently although involuntarily discharged. The hypogastrium, therefore, should be regularly examined, and, on any fulness or tumour being perceived, the catheter introduced.

In order to prevent a relapse during convalescence, the patient must be directed carefully to abstain from any premature exertion, either of body or mind, and very slowly and gradually to return to his ordinary diet and pursuits.

THEORY OF FEVER.

The most ancient theory of fever is that of Hippocrates. He imagined that it arose from some morbid matter, either generated within the body, or introduced from without, and that, in order to fit it for expulsion, or to assimilate it to the natural humours, and thereby render it harmless, a sort of fermentative process was set up in the blood, which he called concoction. He supposed that this process of concoction required a certain number of

days to be complete, that when most complete it proved most salutary, and consequently, that it ought not to be prematurely interfered with by the remedies of the physician. When the morbid matter had thus undergone perfect concoction, provided it were not assimilated to the rest of the animal fluids, it was expelled from the system in the form, either of a hæmorrhage, a sediment in the urine, a sweat, a diarrhœa, an abscess, or an eruption upon the surface.

This doctrine appeared to derive considerable countenance from what is observed to take place in Eruptive fevers, disorders which are manifestly produced by a morbid agent applied to the body, and which are especially characterized by eruptions which were accounted critical. Nevertheless, it is perhaps a sufficient objection to this doctrine, that in many cases of fever, such, for example, as those arising from atmospheric vicissitudes, we have no evidence of either the entrance into, or the expulsion from, the system, of any morbid matter whatever; whilst, in Intermitting fever, which obviously arises from the application of a morbid agent to the body, the disease does not cease, notwithstanding the reputed critical discharges,—sweat, and sediment in the urine, present themselves after each paroxysm.

After an almost uninterrupted reign of fifteen hundred years, the doctrines of Hippocrates were supplanted by those of Boerhaave about the close of the seventeenth century.

Boerhaave's theory of fever was founded upon purely mechanical principles. He imagined that the blood consisted of particles of different sizes—red particles, lymphatic particles, and the particles composing the serum; the red particles being the largest, those of the serum the smallest. As he conceived the ultimate atoms of all these particles to be

homogeneous, and that the relative proportion of red, lymphatic, and serous particles depended upon the degree of aggregation or cohesion existing amongst the ultimate atoms, he found no difficulty in supposing that this degree of cohesion might vary in different individuals, or in different conditions of the same person : a high degree of cohesion in this way, giving a preponderance of red particles ; a less degree of it, a preponderance of lymphatic particles ; and, least of all, a preponderance of serum. Upon these premises he founded the notion, that according to the degree of cohesion, or, in other words, according to the size of the prevailing particles, the blood might be at one time thicker, and at another time thinner than natural.

In fever, he supposed the blood to become preternaturally thick, constituting the *lensor* or viscosity of the blood, so famous in the Boerhaavian school. This thick blood, not being capable of entering the small extreme vessels, necessarily accumulated about the heart and in the larger arteries, and so gave rise to the coldness, paleness, and shrinking of the surface, the arrest of the secretions, the feeble frequent pulse, the oppression at the præcordia, and other signs characteristic of the first or cold stage of fever. After a time, however, the rapid action of the heart had the effect of breaking down the *lensor* of the blood, the friction of that fluid against the sides of the arteries occasioning at the same time a remarkable evolution of heat, so as to produce the phenomena of the hot stage ; whilst, the increased impulse of the thinned blood against the perspiratory vessels sufficiently accounted for the third or sweating stage of the disorder.

It cannot be necessary to attempt, at the present day, any elaborate refutation of a doctrine founded so exclu-

sively upon purely meechanical principles. It will be sufficient to observe, that we have no proof of the existence of that lentor or viseidity of the blood in fever which is made the foundation of the whole theory; and, even supposing it to exist, it is scarcely possible to conceive how an emctic, or a dose of cinchona should, in some instances, so instantaneously remove it; neither is such a theory at all reconcilable with the repeated cessation and return of the paroxysms of an Intermitting fever.

Stahl and Hoffinan, contemporaries of Boerhaave, were the first to direct men's minds to the condition of the nervous system as producing and constituting disease, in opposition to the hitherto prevailing humoral pathologists, who had attributed disease to alterations taking place in the fluids of the body.

Upon this novel view of the nature of disease in general, was founded a theory of fever in particular, which, with very slight modification, was afterwards adopted by Dr. Cullen.

According to the theory of Dr. Cullen, all the remote causes of fever act as sedatives to the nervous system, and thereby diminish the energy of the brain. In consequence of the general depression resulting from this sedative operation, a corresponding degree of debility is induced in the several organs of the body, and more especially in the heart and arteries. The debility of the latter, however, is most considerably felt by the extreme vessels, which, partly from this atony, and partly from an intervention of the *vis medicatrix naturæ*, become affected with spasm, and so give rise to the phenomena of the cold stage of fever. This spasm of the extreme arteries sooner or later proves a stimulus to the heart, rouses that organ into activity, thereby restores the energy of the brain, and

so brings about the hot stage ; whilst the third or sweating stage results from the ultimate removal of the spasm, and the increased impulse of the circulation upon the relaxed vessels of the surface.

It may be objected to this theory, that it is neither founded on correct observation, nor supported by legitimate reasoning. In many cases of fever, especially of the Continued form, we have not the least evidence, or even appearance of spasm of the extreme vessels ; and it cannot be sound reasoning to argue that the *vis medicatrix naturæ* actually increases a morbid state, which its very interference was intended to remove. The surface of the body is shrunk and pinched, in the cold stage of an ague, but in many cases of Continued fever it is not less obviously loose and relaxed ; and even supposing the causes of fever to produce an atony of the extreme vessels, which leads to spasm, we cannot conceive it to be the province of the *vis medicatrix naturæ* to increase that very spasm, for the removal of which its interference is necessary.

As countenancing the existence of a spasm of the extreme vessels, some stress has been laid upon the fact, that when reaction is fully established, the skin, although freely supplied with blood, continues for some time incapable of perspiring ; it is to be remembered, however, that the flow of perspiration is not a merely mechanical process, but a vital operation, a function, the due performance of which requires a healthy condition of the discerning organs ; and during the reaction of fever, such a healthy condition of the discerning vessels, cannot by any means be supposed to be present.

Dr. Brown, the pupil of Dr. Cullen, promulgated a doctrine of disease in general, which has long been known by the name of the Brunonian doctrine.

According to Brown, every individual is born with a certain quantity or stock, of what he calls *excitability*, but whether it be a superadded material, or a mere quality, we are not very distinctly informed. Various agents or *stimuli*, such as food and air, acting upon this excitability, produce the phænomena which constitute life, but at the same time tend to exhaust or consume it: its complete exhaustion terminating in death. Although he regarded this excitability as an indivisible whole pervading the body, he nevertheless imagined, that it might vary in quantity at different times, according to the intensity or continuance of the stimuli applied to it. When the excitability and stimuli are in due proportion to each other, health is the result; whereas, if the stimuli be more or less than that essential to health, the excitability becomes defective or in excess. Whether the excitability be allowed to accumulate from too little, or be exhausted by too much stimulus, debility is equally the result. When the debility is the consequence of accumulated excitability, or in other words, the effect of deficient stimulus, it is said to be direct; when the consequence of exhausted excitability from previous excess of stimulus, it is said to be indirect.

He divided all diseases into two classes, the *Sthenic* or diseases of strength, and the *Asthenic* or diseases of debility, subdividing the latter into those depending upon direct, and into those depending upon indirect debility. In Sthenic diseases, or diseases of strength, the stimuli were supposed to be in excess, but not so excessive as to exhaust the excitability and so induce indirect debility, and the proper practice consisted in lessening the stimuli by the general adoption of antiphlogistic measures: whereas, in Asthenic diseases, or diseases of debility, on the contrary, a certain quantity of stimulus was necessary, pro-

portionate to the demand; diseases of direct debility requiring a moderate, those of indirect debility a more liberal supply.

It would be quite superfluous to enter into a serious refutation of this ingenious, but fanciful, erroneous, and mischievous doctrine. To be told that the excitability inherited at birth is to be gradually exhausted by stimuli, and yet, that it may be at one time deficient and at another in excess, is something little short of an insult to the understanding; whilst it is scarcely less unreasonable to be told, that all agents which operate upon the human system are stimuli, the same in kind, and only differ in degree. Nevertheless unless both these extravagant propositions be acceded to, the whole doctrine must fall to the ground.

As it regards fever in particular, his theory was founded upon debility, but whether direct or indirect, he does not appear to have been very decided; for, whichever view he adopted, insuperable difficulties assailed him. If the debility were direct, he was called upon to show how the causes of fever could by any possibility take the place of more powerful stimuli, and thereby allow excitability to accumulate; and if it were indirect, it was equally imperative to show that these causes possessed a power of stimulation sufficient to exhaust it. He was content therefore to assume the existence of debility, without being very particular as to its kind, and consummated the evils of his general doctrines by a destructive administration of brandy and opium in typhous fever.

Recently, attempts have been made to localize fever, to divest it of the character of being a general disease, and to consider it as a merely secondary effect of some local affection. Dr. Clutterbuck contends that its cause is seated

in the brain, and consists in inflammation of that organ. Broussais with equal confidence asserts that it is the result of inflammation affecting the mucous membrane of the alimentary canal,—the celebrated gastro-enterite of the French school.

Doubtless, inflammation of the brain, and inflammation of the mucous membrane of the alimentary canal, are, the former very frequently, the latter very uniformly present in a greater or less degree in the Continued form of Idiopathic fever; nevertheless, neither the symptoms during life, nor dissection after death, establishes the necessary existence of either the one or the other even in a Continued fever, whilst it appears scarcely possible to reconcile such theories with what is observed to take place in Intermittents. We are not, therefore, justified at present in regarding these states, however important, as anything more than accidental complications of Idiopathic fever.

After a review of these several doctrines, and the objections urged against each of them, the student will probably feel disposed to inquire, whence the difficulty of arriving at a correct theory of so familiar a morbid condition as Pyrexia, or a febrile state? Perhaps the best mode of replying to such an inquiry will be to offer a brief commentary on what appears to be at present known on the subject.

It has already been observed that a febrile state of the body may be induced by a variety of causes; by miasmata, by a contagion, by atmospheric vicissitudes, and by local violence. It next becomes a question, what do these several causes possess in common, either as it regards their nature, or their operation? In regard to their nature, it is on all hands admitted that they so far correspond, as to possess in common the power of injuring or deranging the

system of the individual to whom they are applied; but in respect to their operation, all are not agreed as to the mode in which the injury or derangement is brought about. Some contend for a twofold mode of operation, and are inclined to maintain that miasmata and contagion induce a febrile state by at once entering the blood and vitiating that fluid, the nervous system being only secondarily affected through the medium of the blood so vitiated; whilst they at the same time are compelled to admit, that hardships, atmospheric vicissitudes, and local violence, act primarily on the nervous system, the blood being only secondarily affected.

It is hereby admitted, then, that a morbid condition of the nervous system, induced either directly or indirectly, is present in every instance of a febrile state, whilst a vitiated state of the blood is acknowledged to be only occasionally the primary step in the process. The conclusion therefore seems to be irresistible, that the foundation of that condition which we denominate febrile, appertains *essentially* to the nervous system. But is this essential condition of the nervous system secondary to a vitiated state of the blood in any instance whatever? It is true that miasmata and contagions have been said to induce a febrile state by primarily entering and vitiating the blood, but of this we have no proof whatever, and when a febrile state is the result of local inflammation induced by external violence, it is quite certain that no such primary vitiation of the blood can have place.

It may possibly be imagined that in every local inflammation, the blood of the inflamed part becomes so altered as to vitiate the entire circulating mass; and that even miasmata and contagions may act in this way, by prima-

rily inducing some local inflammation. Neither of these positions, however, derives support from what is at present known upon the subject.

As favouring the notion of vitiated blood proving the cause of a febrile state, experiments have been quoted, in which the injection of noxious matters into the blood-vessels has induced it. But in such cases the violence inflicted upon the vessels themselves by the poisonous substances, appears to have been overlooked; and we know from experiment, that the internal coat of the blood-vessels is extremely susceptible of impressions, perhaps more so than any other tissue of the body; and consequently, in the experiments quoted, we discover nothing more than instances of a febrile state, arising from a severe local injury or irritation, the blood probably being no further concerned in its production, than in constituting the vehicle of an irritating substance applied to the internal coat of the blood-vessels. When indeed irritating substances are injected directly into the blood-vessels, or when medicines find their way into the current of the circulation by absorption, it is reasonable to suppose that these agents being thus applied simultaneously to an extensive surface of the susceptible blood-vessels, and moreover conveyed to every tissue and organ of the body, must exert an influence beyond what would result from their more partial application. But whatever that influence may be, such admixture with the blood is proved by experiment not to be necessary to their operation on the system at large. It appears probable, therefore, that the primary impression essential to a febrile state, is made upon the nervous system, and that this impression, in every instance, results directly from the operation of the morbid agent upon that system, and

never indirectly from its primarily diseasing the blood. But admitting that the primary impression is made upon the nervous system, it may be asked what is its nature? In reference to this question, we must, in the present state of medical science, acknowledge our total ignorance. Indeed, we are yet altogether ignorant of the mode in which the nervous system discharges its important functions in health. These mysterious functions are performed in a still and silent manner; there is nothing to be seen, nothing to be heard or felt, and our ignorance is complete. When these functions are deranged, the derangement constitutes disease; and when a medicine is successful, it corrects the deranged and restores the healthy condition of these functions; but we are just as ignorant of the change which constitutes disease, as we are of the nature of the nervous function in health; and we are not less ignorant of the nature of that impression by which a medicine restores health, than of the change which is productive of disease.

If thus ignorant of the kind of impression made upon the nervous system by morbid agents, are we better acquainted with the mode in which it is communicated; or, in other words, are we acquainted with the part or portion of the nervous system primarily acted upon? Is the primary impression made upon the animal or upon the organic system of nerves? Does a febrile state consist essentially in a morbid state primarily induced in the former or in the latter of these systems?

Although the animal system is in an especial manner distinguished by administering to the intellectual powers, and the organic to the organization of the body, we nevertheless find these two systems as singularly blended in structure, as we observe the corporeal and intellectual func-

tions manifestly and reciprocally influencing each other. Such mutual influence undoubtedly creates considerable difficulty in determining with precision which of these systems is primarily effected by morbid agents.

Recent experiments, however, appear rather to favour the belief that morbid agents affect the body at large, through an impression primarily communicated to the organic system of nerves; for in experiments lately made with certain active substances, it was found that the general effect occasioned by their application to a part of the body was instantaneous, and that the general affection took place with equal rapidity even after the communication between the irritated part and the rest of the body by means of the animal system of nerves had been completely interrupted by the division of the spinal marrow. Their instantaneous operation precludes the possibility of their acting through the medium of the circulation, whilst their effects upon the general system after the division of the cerebro-spinal nerves render it more than probable that they act by an impression made upon the nerves of organic life.

Upon the whole, it appears probable, that the primary morbid change, essential to the febrile state, whether induced by miasmata, by a contagion, or by local violence, or any other cause, takes place in the organic nervous system; and that the derangement of the animal nervous system, as well as the altered condition of the blood and its secretions, is a mere effect or consequence of that change. The earliest indications of this original morbid condition of the organic system, are usually such as we find characterizing that part of a febrile state commonly denominated the cold stage, or stage of depression; but we know that after this depressed state has lasted a variable period, it is succeeded by what is called reaction, a state, not of torpor,

but of extraordinary and excessive excitement. Whence this change?

Some have sought for the cause of this change in the *vis medicatrix naturæ*, so long in vogue in the schools of physic, a power supposed to be inherent in the human body, by which it resists the operation of those agents which tend to injure or destroy it.

Doubtless the human body is so constructed that hurtful agents occasionally bring about changes, calculated in the end to prevent or counteract the mischief that would otherwise result from them. We observe this in the case of a foreign body in the larynx, exciting cough, by which the foreign body is expelled; we observe it in the removal of irritating substances from the eye by a flow of tears occasioned by their presence; and we observe it in innumerable instances of the granulating, and especially of the adhesive process under inflammation. Indeed, these salutary effects have appeared to some so remarkable, that they have not scrupled to ascribe them to the operation of a distinct intelligent existence; such were the *Archæus* of Van Helmont, the *Autocrateia* of Stahl, and the *Anima Medica* of Dr. Nicholl. It must, however, appear sufficiently obvious to the modern physiologist, that such a distinct preservative power is altogether a gratuitous assumption, that it is a mere cloak for ignorance, and that even if admitted, it serves to explain nothing whatever in regard to the question at issue.

Some have attempted a more mechanical solution of the phenomena which distinguish reaction. They have supposed that the blood accumulated about the heart during the first or cold stage of a febrile state, mechanically excites that organ to the increased action so characteristic of the second or hot stage. But of this we have no proof,

whereas, the total absence of the cold stage, occasionally observed in Ague, and especially in Hectic fever, is altogether at variance with so mechanical a view of the matter.

We are content, therefore, to regard it as probable, that the symptoms of reaction, like those of the first stage of a febrile state, are owing to a morbid condition of the organic nervous system; but of the change which takes place in that system, by which the symptoms of the first are converted into those of the second stage, we must again confess our entire ignorance. Whatever it may be, we know that its effects are especially manifest in the functions of those organs which derive their vital endowments from the nerves of organic life, the organs of circulation, secretion, and nutrition.

How much the character of the febrile state in particular diseases is influenced by the secondary condition of the blood, secretions, and excretions, it is impossible to offer even a reasonable conjecture. It is nevertheless extremely probable that that influence is very considerable, especially in those malignant forms of fever, in which the vital powers have been much exhausted, either by circumstances operating before, or by improper management after the attack; for, when no longer subjected to that kind or degree of nervous influence, which we know to be necessary to the perfect integrity, as well of the fluids as of the solids of the body, the blood and its secretions undergo important changes; the former no longer presenting its usual healthy aspect even to the sight; the latter, being not only deficient or excessive in quantity, but moreover depraved in quality, and not unfrequently manifesting a remarkable tendency to pass speedily into decomposition, or even actual putrefaction.

In conclusion, as we conceive inflammation to consist

essentially in a diseased function of a part only of the organic nervous system, so do we think it probable that a febrile state consists essentially in an universal disorder of that system of a different kind: as the *general* phenomena of inflammation are the same, whether induced by a local injury, by cold, or by venereal poison, so are the general phenomena of a febrile state the same, whether occasioned by a local injury, by miasmata, or by a contagion: as the progress, effects, and mode of treatment of inflammation vary accordingly as it is produced by violence or by venereal poison, so are the progress, effects, and mode of treatment of a febrile state varied accordingly as it is induced by local violence, by miasmata, or by a contagion.

INFLAMMATION.

WHEN any part of the body presents the phenomena of pain, redness, heat, and swelling, it is said to be affected with Inflammation; such inflammation, when extensive or severe, being usually attended with a febrile state of the system at large, which is regarded as Secondary or Symptomatic.

The local signs enumerated are those which pretty uniformly distinguish inflammation seated externally, and dissection leads to the belief that all of them are present also, in a greater or less degree, in inflammation of an internal part. But although these local signs when present are usually sufficient to indicate the existence of inflammation, we should entertain an extremely imperfect notion of that morbid condition were we to rest contented with

such a definition, for we shall find that inflammation speedily gives rise to changes affecting the secretions and tissues of the part, which are of infinitely greater importance, both as it concerns the integrity of the part itself, and the safety and welfare of the patient. We shall therefore in the first instance offer a few comments on the ordinary local and constitutional signs of inflammation, and afterwards proceed to point out the progressive changes and ultimate consequences produced by it.

Pain.—This varies both in kind and degree, according to the character and violence of the inflammation, and according to the texture and situation of the inflamed part. It is most severe in what is called Acute inflammation; it is less so, and sometimes altogether wanting in the Chronic forms of the complaint. When the part inflamed, either from its peculiar texture or from its situation, cannot readily yield to the swelling which usually accompanies inflammation, the pain is apt to be extremely violent and tense; whereas in loose textures, especially of scrofulous subjects, the inflammation may be even acute with very little pain. It is not always the texture most sensible in health that becomes most painful during a state of inflammation; on the contrary, some structures, such as tendon and ligament, which possess little sensibility in health, frequently occasion the most exquisite pain when inflamed. Certain peculiarities of constitution greatly influence the pain; thus, persons of the sanguine temperament and of great natural susceptibility, generally experience greater pain under inflammation than those of a leucophlegmatic and more torpid habit; whilst in certain cachectic states of the body induced by accidental circumstances, inflammation occasionally runs on rapidly to a fatal termination without having been attended by a sufficient degree of

pain to create even a suspicion of its existence. The kind of pain is infinitely varied: it may be of a stabbing, cutting, burning, or tensive kind, and more or less exquisitely distressing; or it may be smarting, pricking, stinging, tingling, or itching, so as scarcely to amount to actual suffering: it may be acute or it may be dull; it may be fixed or it may dart from one point to another; it may be constant or it may recur at intervals; it may be uniform or partake of a throbbing character. In almost every instance it is increased by moving or by making pressure upon the part, and indeed inflammation even of an acute kind is frequently unaccompanied by any pain whatever, so long as the inflamed parts are allowed to remain perfectly at rest.

The pain, whatever may be its kind or degree, appears in every instance to result from a change induced in the sensibility of the cerebro-spinal nerves of the part; for experiment has shown that inflammation may take place in a limb completely paralysed by injury to the spinal marrow, but that such inflammation is not attended by the least pain.

Redness.—This varies according to the intensity of the inflammation, the texture of the part affected, and the state of the patient's constitution at the time. Ordinary inflammation in a healthy person produces, when moderate, a pale redness; when more intense, a scarlet tint,—the brightness of the hue being usually most considerable at the centre of the inflamed surface, and in parts situated nearest the heart. In bad constitutions the redness is commonly of a deeper tint, sometimes dingy, purplish, or livid, these tints being most strongly marked in parts remote from the heart.

If to a naturally transparent and colourless part of the

body, we apply any substance capable of inducing inflammation in it, and attentively watch the successive changes which manifest themselves during the interval between the application of the irritating substance and the development of the inflammation, we discover proof that the increased redness arises from the influx of red blood into vessels which previously admitted only the colourless part of that fluid. In tracing these changes on the conjunctiva of the eye, it is distinctly perceived that minute vessels which are naturally red become gradually enlarged, and that others which are mere prolongations of these, but which were previously imperceptible, become in their turn so enlarged as to admit red blood and to be distinctly visible. It is obvious therefore that in every inflamed part there is a preternatural quantity of blood, and consequently that in every inflamed part the blood-vessels are preternaturally distended. It is also probable, that in acute inflammation at least, there is not only an increased quantity of blood in the part, but moreover an unusual quantity circulating through it; in acute inflammation of the hand, for instance, the artery at the wrist has been observed to beat with greater force, and the veins of the fore-arm have been found more distended with blood than in the unaffected side of the body.

Heat.—This symptom of inflammation has at all times attracted so much attention as to have given origin to its name in most languages. The Greeks derived their *φλεγμονή* from *φλέγω*, ‘to burn’, and their *φλόγωσις* from *φλόξ*, ‘a flame’, whilst the *inflammatio* of the Latins and our own ‘inflammation’ have a corresponding meaning. The heat nevertheless is much more apparent than real, and has been ascertained by experiment never to exceed the temperature of the blood at the heart. It is most distinctly

observable in external inflammations, when the part affected is remote from the centre of circulation, in consequence of such parts being naturally of a somewhat lower temperature than those situated nearer the heart.

As we are ignorant of the nature of the operation by which heat is evolved during health, we cannot offer any satisfactory explanation of the cause of its increase in inflammation, unless indeed we may suppose it to depend upon the mere increased activity of the circulation, which is manifestly present in the acute forms of the disease.

Swelling.—This varies much according to the violence of the inflammation, the texture affected, and the state of the constitution. In any given degree of inflammation, we usually find the swelling most considerable in soft and loose textures, and in feeble and lax constitutions. It is commonly attended with a sense of tension or stretching proportionate to the resistance offered to the swelling by the surrounding structures. In loose cellular texture, especially in scrofulous habits, the sense of tension is sometimes very slight, although the swelling may be great; whereas in inflammation of cellular texture situated beneath a fascia, the swelling itself is often comparatively trifling, whilst the sense of tension is most distressing.

The swelling in inflammation unquestionably arises in part, from the increase in the quantity of circulating fluid, and partly perhaps from mere diminution of cohesion of the tissues, but chiefly from the serous and albuminous matters poured into the inflamed structures and into the surrounding cellular tissue. When the swelling of the latter is occasioned by serous fluid, it commonly pits upon pressure, and for the most part quickly disappears on the subsidence of the inflammation; but when, with or without serum, albumen is thrown out by the vessels of the

inflamed tissues, the swelling is harder, and sometimes remains permanently, in consequence of the albumen becoming organized.

It has been observed that when inflammation is violent or extensive, there is usually superadded to the local signs a pyrexia or febrile state of the system at large. The type or character of this accompanying pyrexia presents considerable variety, according to the age and constitution of the patient, and the seat and severity of the inflammation; it is also observed to undergo remarkable modifications during its progress, depending upon or in connexion with certain changes taking place in the inflamed parts. In acute inflammation affecting persons who are otherwise healthy or robust, it is generally characterized by a hot skin, a frequent, full, and often hard pulse, a white tongue, thirst, and by the blood when drawn exhibiting the inflammatory or buffy coat. This assemblage of symptoms constitutes what has been more strictly called Synocha, or Inflammatory Fever. Even in acute inflammation, however, attacking healthy or robust subjects, the symptoms enumerated are occasionally very much modified when the inflammation attacks structures with which the system at large powerfully sympathizes, or when the inflammation happens to interfere with the functions of important organs. In certain inflammatory conditions of the brain, for example, we often have a slow and irregular pulse, whilst in violent peritonitis there is not unfrequently extreme and rapid prostration, together with a small and hard pulse from the very commencement.

In the aged, and in persons of a bad or cachectic habit of body, the pyrexia, even of acute inflammation, is more indicative of a want of power in the system, and often partakes in a greater or less degree of a typhoid cha-

racter, this typhoid character presenting in different instances a variety both of aspect and degree, nearly the same as has been pointed out when treating of common continued fever.

With respect to the blood, we are ignorant of the exact changes which take place in that fluid during the continuance of the pyrexia of inflammation. Although experiment renders it probable, it remains to be positively demonstrated whether or not there be any actual increase in the proportion of its albumen: but be this as it may, it is now well ascertained that blood drawn from a vein at this time and allowed to remain at rest in an ordinary atmosphere, not only separates as usual into serum and crassamentum, but the latter is found to be made up of an inferior layer of albumen mixed with colouring matter and of a superior layer of albumen. To this superior layer, altogether devoid of red particles, has been given the name of inflammatory or buffy coat.

In acute inflammation attacking healthy subjects this buffy coat is generally of a whitish colour, very tough, of considerable thickness, cupped in the centre, and more or less contracted or curled at the edges. When the vital powers are weak or impaired, this buffy coat is usually softer, of a yellower colour, and less cupped; whilst in the typhoid prostration, occasionally observed in pyrexia of inflammation, it not unfrequently amounts to little more than a thin and fragile layer of gelatinous looking albumen; or the soft and dingy clot merely presents a little bloody serum on its surface, and fails to separate a buffy coat at all.

The particular condition of the blood upon which the development of the buffy coat depends remains to be discovered. Some have attributed it to slow coagulation, and

the consequent descent of red particles to the bottom of the containing vessel, some to the thinness of the blood, some to its containing an actually larger proportion of albumen than natural, and others to the escape of carbonic acid gas. None of these opinions, however, have been fully or satisfactorily established. Whatever the state of the blood may be, we know that it is very commonly induced in a short time by the process of inflammation, especially when of the acute kind. It is nevertheless true, that the buffy coat may be present when there is no evidence of inflammation of any kind, as has been observed in pregnant women, and in persons under the specific operation of mercury; neither is it uniformly found in every case of even acute inflammation. Its development is also very much influenced by circumstances attending the abstraction of the blood; it is most certainly and most perfectly developed when the blood is made to flow, in a continuous stream, from a free orifice into a narrow cup; whereas when the blood is taken from a small orifice, when it is received into a wide vessel, when it is allowed to trickle over the arm, or to fall drop by drop, or when it is much shaken, it either fails to appear at all, or appears only in a very slight degree. Neither is there uniformity in the appearance which it assumes when received into separate cups. Sometimes the blood in the first cup is highly buffed, that in the second and third gradually less so; at other times the first cup shall fail to display any buffy coat, whilst the second and third shall do so in a very exquisite degree.

Having premised these few comments on the ordinary local and general signs by which the presence of inflammation is recognised, the next step will be to point out the changes which take place in the inflamed part, and the effects

produced by these changes upon the constitution. The most obvious and remarkable of these changes are, 1. A diminution of cohesion, or softening of the inflamed tissue; 2. An effusion of serum; 3. An effusion of spontaneously coagulating albumen, either in an organizable state, when it is commonly called coagulable lymph, or in an inorganizable state, when it receives the name of pus; 4. A complete arrest of the organic functions of the part, constituting gangrene and sphacelus.

Loss of Cohesion, or Softening.—This is perhaps the most constant of all the immediate effects of inflammation, the induration occasionally observed to result, as well from acute as from chronic inflammation, being for the most part merely an ulterior consequence of the lodgement, or of the more or less perfect organization of albumen effused into the inflamed tissue itself, or into the surrounding cellular membrane. It seems to be a general law, that the more dense the tissues of a living body, the more nearly does their structure approach to that of inorganic matter, and a larger proportion of inorganic materials does there enter into their composition. It also appears to be a general law, that the more nearly the organic approaches in structure to inorganic matter, the less are they disposed to undergo decomposition or disintegration from causes which act upon their proximate or ultimate elements. In accordance with these laws, we find, that relatively, a less degree of what in our ignorance we call Vital Power is manifested by the harder than by the softer tissues of the body, as if the degree of vital power bestowed upon the respective structures were proportionate to their liability to disintegration, and intended as a means of preventing or counteracting it. Bone, cartilage, and tendon, which in structure approach nearer to

inorganic matter, which contain a larger proportion of inorganic materials, and which consequently have a less tendency to disintegration, are endowed with a very slender degree of vital power; whilst muscles and the softer tissues, which in structure are further removed from inorganic matter, which contain less inorganic materials, and which therefore have a stronger tendency to disintegration, are endowed with a more exquisite degree of that vital power.

Whatever this vital power may be, we know that it differs in different constitutions, that it is often impaired or improved by art, and that, as just observed, it is much more exalted in some tissues than in others. It is generally feeble in scrofulous constitutions; it may be rendered so in any constitution by intemperance, and is comparatively inconsiderable in bone, cartilage, and tendon.

Since, therefore, the natural density of each structure is maintained by its vital power, and as the immediate effect of inflammation in every instance is to lessen such density, or, in other words, to diminish cohesion, we are justified in concluding that inflammation tends uniformly to exhaust the vital powers of the inflamed tissue. Accordingly, it is found that in scrofulous habits, in cachectic constitutions, and when it attacks bone, cartilage, and tendon, the vital powers of the part are more rapidly exhausted by a given degree of inflammation than under opposite circumstances; such exhaustion of the vital powers being manifested in the softer tissues by a loss of cohesion sometimes amounting to liquefaction, whilst in bone and the other harder tissues, which more powerfully resist disintegration for the reasons already assigned, the exhaustion of the vital powers is most frequently productive either of actual death of the structure without disin-

tegration, or of the more tardy modification of the softening process called ulceration.

Effusion of Serum.—As cellular tissue naturally secretes a vapour or moisture, and as this tissue pervades almost every structure of the body, it cannot be a matter of surprise that a preternatural quantity of the serous secretion should be found in and around the inflamed part. It is probable, however, that the very first effect of inflammation is to diminish or arrest the secretion; but whether this be so or not, it generally sooner or later becomes considerably increased. It varies both in quantity and appearance, according to the structure affected, the intensity of the inflammation, and the constitution of the patient. In the subcutaneous cellular tissue, the swelling it occasions is found to pit upon pressure, and is called inflammatory œdema. If the inflammation of a part be moderate and of short duration, the matter effused may be chiefly or exclusively of a serous character; but if the inflammation prove severe and obstinate, the serum is often found mixed with opake albuminous matters, partaking more or less of the nature of what have been called coagulable lymph and pus. In the inflammation of serous and synovial membranes, corresponding changes are observed to take place, the secretion of the former being not only increased in quantity but altered in quality, and presenting a greater or less admixture of albuminous matter, rendering it milky and opake, the secretion of the latter also occasionally putting on a purulent appearance.

This effect of inflammation constitutes the most common form of what has been more strictly called the termination in *Effusion*.

Effusion of spontaneously coagulating Albumen.—Un-

less from an occasional admixture of the colouring matter of the blood, the whole of the morbid products of an inflamed part, as well albuminous as serous, present originally the form of an almost colourless transparent fluid: the composition of this fluid however varies in different instances, sometimes being purely and permanently serous, at other times separating spontaneously into serum and solid albuminous matter almost immediately after quitting the living vessels. In an inflamed part, therefore, we find albumen in three distinct forms: 1. As it exists in solution in the effused serum, from which it may be artificially precipitated in an insoluble and amorphous form by heat and by mineral acids; 2. In a solid state, either in mere shreds or irregular particles diffused through the serum, and rendering the latter more or less turbid, or more massive and plastic, when it usually receives the name of coagulable lymph and is capable of organization; 3. In a peculiar granular form swimming in a serous fluid, as shown by the microscope, when it receives the name of pus, and is incapable of organization.

When the effused albumen takes on the more massive or plastic form capable of organization, it commonly becomes a bond of union between the inflamed or wounded surfaces upon which it happens to be effused, and thence constitutes the effect or termination of inflammation, called

Adhesion.—This adhesive process, which some have regarded as an exclusively salutary provision of nature, does not take place with equal facility or to the same extent in every structure. It occurs most frequently and in the most exquisite degree on serous membranes and in cellular tissue. It is in these structures too that its salutary tendency is most apparent, for when inflammation attacks a serous membrane, organizable albumen is thrown out

upon its surface; this organizable albumen adheres to the adjacent structures, and becoming organized forms a permanent bond of union between them and the inflamed membrane. In this way many serious and even fatal consequences, which would otherwise result from disease, are effectually obviated: should an abscess, for example, form in the lungs, or in any of the abdominal viscera, that abscess on reaching the surface of the organ might burst and pour its contents into the respective cavities of the chest or abdomen, and thereby occasion inflammation and speedy death; whereas, the approach of the abscess causing the serous membrane to inflame, organizable albumen is effused by it, this albumen glues the organ containing the abscess to the neighbouring parts, and so prevents the mischief. A corresponding advantage of the adhesive process is observed in the inflammation of cellular tissue, for on the formation of an abscess, the effused organizable albumen binds together the cells around it, prevents the extensive diffusion of its contents, and ultimately leads to the formation of what is called the cyst of an abscess. The same salutary tendency of the process is observed in what is called by surgeons *union by the first intention*, two wounded surfaces being brought into contact, organizable albumen is poured out, and they are quickly united to each other. Thus, also, when a ligature is applied to a wounded artery, the inflammation excited by it in the internal membrane causes the effusion of organizable albumen, which presently obliterates the canal. Nevertheless, unfavourable consequences are occasionally observed to result from this adhesive process. When the organizable albumen is effused in considerable quantity, it may on becoming organized occasion deformity, or interfere with

the motions of parts ; when adhesions form between the pleuræ they may derange the respiration ; and more especially, when unnatural adhesions and false membranes result from inflammation of the peritoneum, they may seriously and even fatally interrupt the functions of the intestinal tube.

Organizable albumen is very rarely effused in inflammation of mucous membranes. In the few instances in which it happens, the albumen is usually spread over the surface of the mucous membrane so as to take on the form of the respective cavity or canal, and without causing any adhesion of one part to another. When adhesion of mucous membranes therefore takes place, it is most frequently in consequence of preceding ulceration having laid bare the submucous cellular tissue.

When pus is formed in the progress of inflammation, it is either poured out upon some inflamed surface, or it accumulates in the interior of a part or organ, such accumulation constituting an abscess. The morbid process by which pus is formed is called *Suppuration*, and sometimes Suppurative Inflammation, whilst the suppuration itself is commonly but erroneously said to be one of the terminations of inflammation.

Pus is an unctuous-looking fluid about the consistence of cream, usually of a white or pale yellowish colour, having a sweetish or mawkish taste, inodorous when cold, but emitting a faint smell when warm or heated. Examined through a microscope it is found to consist of globules or particles of albumen swimming in a serous fluid, the globules or particles, like the red particles of the blood, yielding iron on incineration, and the serous fluid being, like ordinary serum, coagulated by heat and mineral acids.

When it presents the appearances described, it is said to be true, genuine, healthy, or laudable pus. It is observed, however, to vary more or less, according to the intensity of the inflammation, the texture of the inflamed part, and the constitution of the patient. It may be thin or unusually serous, flaky, curdy, thick, viscid, or slimy; it may be mixed with blood; it may be rendered offensive to the smell by its proximity to a diseased bone or by contact of air; and it may probably be modified by the admixture of certain tissues disintegrated or liquefied by the inflammation.

Massive and globular albumen, or, in other words, organizable albumen and pus, appear to be very closely allied to each other. We discover this close alliance in the fact, that when wounded surfaces are brought in contact, a moderate degree of inflammation will cause an effusion of organizable albumen, whilst a more intense inflammation will occasion the formation of pus. We find a similar illustration in the admixture in various proportions of the two products, so often found in the same inflamed tissue. Indeed it is not improbable that the chief difference between organizable albumen and pus may consist in the more exquisite degree of vital endowment imparted to or retained by the former than by the latter; and it is certain that when the vital powers of the part are impaired by the mere intensity of the inflammation, or when the constitutional powers are weak, as in scrofulous and cachectic habits, we often have pus produced, when in good constitutions we should have expected the formation of organizable albumen. We discover a still more intimate connexion between organizable or at least massive albumen and a modification of puriform matter frequently met with in certain inflammations.

The puriform fluid here alluded to, appears in many instances to result from a softening down or liquefaction of albumen which had originally assumed the massive form. We see this transition of massive to puriform albumen in the central parts of certain abscesses, in some of the products of inflamed serous membranes, in the changes which take place in the albuminous deposit called tubercles, and even in the albuminous mass which separates spontaneously from stagnant or extravasated blood. Here also, when massive albumen appears to soften down into a puriform fluid, the change can in general be traced to some circumstance, the tendency of which is to impair that degree of vital influence which the albumen may be supposed to have possessed when first thrown out by the living vessels, or which it might have derived from the living organized structures immediately surrounding it.

Although suppuration may occur in almost any structure of the body, it does not take place with equal certainty and rapidity in all. Its certainty and rapidity are greatest in inflammation of mucous membranes, the pus being blended in variable proportions with the mucous secretion, and thereby constituting what has been called puriform mucus: it frequently occurs in inflammation of serous membranes, especially when severe, or when it attacks persons of bad habit of body: it is now and then met with in inflammation of synovial membranes, and perhaps more frequently in the interior of parenchymatous organs. Cellular tissue is exceedingly prone to suppuration. What is called a boil, or phlegmon, is merely a circumscribed inflammation of the cellular tissue beneath the skin, the ordinary tendency of which is to suppurate. But wherever cellular tissue abounds, inflammation readily

induces suppuration, the consequent accumulation of pus giving rise to one of the commonest forms of *abscess*. The formation and progress, however, of such an abscess vary considerably in different cases. When acute cellular inflammation occurs in a comparatively good constitution, first serous, and afterwards albuminous matters are effused into the tissue, these effused matters occasioning the swelling and hardness observed at an early period of acute abscess. It would appear, however, that as the inflammation proceeds, a portion of the cellular membrane itself, and of the massive albumen in the centre of the abscess, lose their cohesion so far as to liquefy and assume the appearance of a purulent fluid. This loss of cohesion one might naturally expect to take place first in the centre, or in those parts which have been most violently inflamed, which are furthest removed from the healthy living structures, and which are consequently more feebly supported by vital endowment. We accordingly find, that this softening is generally first apparent in the centre, and gradually extends towards the circumference, until it reaches that portion of the massive albumen which is nearer the healthy living structures, and which is capable of organization. The limits of the softened mass in this way become surrounded by and included in a layer of albumen, which taking on organization, constitutes the bag or *cyst* of the abscess. The internal surface of this cyst becomes a secreting organ, and pours out additional pus. The cyst thus distended by pus sooner or later yields, that is to say, softens and is absorbed, or in other words ulcerates, either in that direction in which there is least physical resistance from density of structure, or at a part possessing the least vital power.

When the pus of an abscess reaches the subcutaneous

cellular tissue, that tissue, as usual, inflames, softens, and suppurates; the connexion of the skin with the tissues beneath is thereby partially destroyed, and its vitality consequently impaired, so that the inflammation set up in it speedily gives rise to softening and absorption; the abscess points, and unless opened by art at length bursts at the pointing part and discharges its contents.

The cyst of an abscess necessarily prevents the general diffusion of its purulent contents through the neighbouring cellular membrane; but in some kinds of abscess no cyst whatever is formed, and such diffusion of the pus actually takes place. This, for the most part, only happens when the constitutional powers are comparatively feeble, and when in consequence the albumen poured out is insusceptible of organization; instead of which, it either softens down from the massive to the purulent form, or it assumes the purulent form from the beginning. We see this in bad cases of erysipelas when the constitutional powers are so feeble that, together with the effused pus, we find extensive destruction of the cellular membrane itself, that structure being either softened down and lost in the general contents of the abscess, or separated in grey and dirty looking sloughs of various sizes.

When suppuration has taken place, certain changes are generally observed in the inflamed part. If situated in the cellular tissue beneath the skin, the pain changes its character, and from being acute becomes of a more heavy, dull, or throbbing kind, the swelling often increases, the redness and hardness diminish, and at length a fluctuation can be distinctly felt. Corresponding changes in the character of the pain are occasionally observed to happen during the suppurative process in the cellular tissue of internal parts, and not unfrequently also in the suppura-

tion of a serous membrane. With these local changes, the patient is often affected with rigors or shivering, and when the suppuration is extensive or of long continuance, generally experiences sooner or later that modification of constitutional disturbance called

Hectic Fever.—This variety of febrile disorder would appear to result in every instance from some unusual irritation, occurring more especially in constitutions already enfeebled by disease. By far the most frequent cause of hectic fever, however, is suppuration. It is sometimes, like an ordinary ague, characterized by a distinct cold, hot, and sweating stage; but notwithstanding that it has in some rare cases even assumed a regularly quotidian or tertian type, it does not present either the steady succession of paroxysms, or the perfect development of the respective stages, met with in ague. In its mildest form, it may not amount to more than occasional rigors, succeeded by an imperfect hot stage, or a mere burning heat of the palms of the hands and soles of the feet, especially after meals, and without any obvious perspiration whatever. In some instances there is a more or less perfect hot stage, occurring especially towards evening, without previous rigor or subsequent perspiration; whilst in others, the rigors and hot stage are absent, and the patient merely suffers from profuse perspirations during the night, or at any time on falling asleep. In its most exquisite form, the exacerbations usually make their approach towards evening, sometimes preceded by chilliness, sometimes not; the skin gets hot and the pulse frequent, with thirst, burning of the palms of the hands and soles of the feet, and a circumscribed flush of redness on one or both cheeks; the patient continues restless and often sleepless, till at length, towards morning, a copious

though perhaps partial perspiration carries off the fever, and leaves the patient pale and languid, but nevertheless with an accelerated pulse. When the exacerbations continue to recur, the strength is rapidly exhausted, the tongue becomes morbidly red, clean, and polished, and at length apthous, or it is dry and brown, whilst the teeth are covered with black sordes; the body is reduced to the extreme of emaciation, the pressure of the bones causes the integuments of the back and hips to ulcerate, colliquative diarrhœa supervenes, and the patient expires completely worn out.

Mortification.—In some instances the destructive influence of inflammation is not limited to the textures originally inflamed, but extends to the blood-vessels themselves, the vital energy of which is thereby exhausted to such an extent as first to impair and ultimately to arrest their functions altogether. The rapidity and certainty with which this change takes place, depend upon the intensity of the inflammation and the degree of vital power of the constitution, or of the particular structure inflamed. Very intense inflammation may induce it even in the most robust constitutions and in the most highly organized textures; but it will do so much more readily in bad constitutions and in textures of naturally feeble powers: in such constitutions and textures indeed, even moderate inflammation is often sufficient to produce mortification.

The impaired function of the blood-vessels in mortification, is generally first indicated by a change in the colour of their contents, communicating to the inflamed structures a dark, dingy, or livid hue, probably with some diminution of the pain. As the mischief proceeds, however, a serous fluid, often tinged with blood, is effused,

either into the substance of the tissues if deep-seated, or beneath the cuticle, causing vesications, if near the surface; the temperature of the part sinks; the pain ceases; the structures become soft, flabby, and somewhat swollen; all sensibility is extinguished; the circulation stops; gaseous matters are occasionally evolved, giving rise to an emphysematous feel in the cellular membrane; the part becomes cold, and the ordinary putrefactive changes of dead animal matter follow, constituting what has been called complete sphacelus.

Should the patient survive, we usually find that after a longer or shorter period, the sphacelated parts appear to irritate the surface of the living structures with which they are in contact; an increase of inflammation is the result, and is indicated by a red line between the dead and living parts, called the line of separation: the enfeebled tissues in contact with the dead mass, being disintegrated by the inflammation thus set up, are removed by the absorbents, and a partial or complete separation of the dead from the living parts is the consequence. The separation may be complete when the adjacent structures are made up entirely of the softer tissues; it is only partial when the dead and living parts are held together by bone or tendons which more slowly admit of the ulcerative process.

Certain textures of the body are more liable to pass into a state of mortification from inflammation than others. It is by no means uncommon in inflammation of the skin, as is occasionally witnessed after the application of a blister; it not unfrequently takes place in inflammation of the subcutaneous cellular membrane, as seen in bad erysipelas and in carbuncle; it now and then occurs in mucous membrane, as in cases of aggravated dysentery; whereas inflammation of serous membranes very rarely produces

it, unless the inflammation be the result of a physical cause, such as intususceptio, hernia, or external violence. Genuine mortification is rarely met with in fibrous membranes; more frequently in tendons. Cartilage is much more prone to ulceration than to mortification. When a bone dies it is said to be affected with necrosis. When it merely ulcerates it is said to be carious.

Gangrene, arising from inflammation in the manner described, has been denominated *acute* or *humid* gangrene, to distinguish it from what has been called *chronic* or *dry* gangrene, a modification of the process which appears to be produced in every instance by the comparatively slow and gradual manner in which the circulation of the part is suspended. This suspension arises most frequently from ossification, and occasionally from inflammation of the arteries; more rarely from a diseased heart or other physical cause of obstruction. In such cases, the same change of colour, the same coldness and loss of sensibility are sooner or later observed, as in the more purely inflammatory gangrene; but it would appear that from the circulation only gradually ceasing, the vital powers are more slowly extinguished, and that the absorbents continuing to act, have the effect of completely drying and shrivelling up the dead structures, and thereby preventing the ordinary putrefactive changes from taking place.

Although mortification to a slight extent may occur even under acute inflammation without any very obvious change being induced in the character of the accompanying constitutional symptoms, it nevertheless most frequently happens, that such a change does take place, the symptoms then assuming more or less of a typhoid character, but varying in degree according to the intensity of the inflammation and the seat and extent of the mor-

tification. The tongue becomes dry and brown, or black, the skin parched, the pulse frequent and feeble or irregular; and when the case is sufficiently severe to destroy life, the countenance appears shrunk and haggard, the expression wild, delirium supervenes, the patient is probably harassed by hiccough, the respiration is laborious, the voice feeble, the extremities become cold, a damp coldness pervades the whole surface, and stupor or convulsions close the scene.

When from inflammation, any tissue gradually loses its cohesion and softens down or liquefies, the liquefied portion is removed by the absorbents, and the process is called *Ulceration*. This ulcerative process may take place in any structure of the body, the solution of continuity occasioned by it being commonly called an *Ulcer*.

When a part has sustained a loss of substance, either in consequence of ulceration, suppuration, sloughing, mechanical violence, or from any other cause; and when the sides of the wound thereby produced cannot be brought together so as to unite and heal by the first intention, it usually happens that an attempt is made to fill up the breach by a natural process, called *Granulation*. The vessels of the broken surface pour out materials very analogous to what we observe in inflammation of serous membranes, being at first transparent and nearly colourless, but presently becoming partly serous, partly puriform, and partly organizable albumen, the proportions of each of these varying in different instances, according to the cause of the disease, the intensity of the inflammation, the structure affected, and more especially the state of the patient's constitution. On the wounded surface the organizable albumen takes on the form of those small red conical bodies to which surgeons have given the name of

Granulations. When these granulations have, by their increase, accomplished the object of filling up the breach, they contract and form a more or less dense and permanent structure, called a *Cicatrix*, such a cicatrix being preceded by the formation of a new skin over the wounded surface, if situated externally.

Predisposing Causes of Inflammation.

The most common predisposing causes of inflammation, are, a sanguine temperament, plethora, a state of the general habit induced by indulgence in ardent spirits, peculiar idiosyncrasy, the infantile period of life, and a previous attack.

Exciting Causes of Inflammation.

Some of the exciting causes produce inflammation by their direct and immediate operation on the part, as is the case with the several varieties of mechanical and chemical violence,—pressure, bruising, cutting, burning, scalding, the concentrated acids and alkalis, and several salts.

Others, again, seem to induce inflammation in a part, through the medium of an impression originally made upon the general system, as is the case with the contagions of measles and scarlet fever, and the poisons of smallpox and syphilis. Cold also most frequently induces inflammation in this way, whether applied to the body generally or to a part of it only, although it is now and then observed to excite inflammation in the part to which it is more immediately applied.

Certain substances taken into the stomach are capable of exciting inflammation in a distant part, either from a direct sympathy existing between that organ and the part affected, or through the medium of an impression made

upon the system at large, as is the case with several varieties of fruit and fish, with arsenic and copaiba, which often occasion an inflammatory condition of the skin. Acrid substances applied to a broken surface, will sometimes excite inflammation in a distant part, as is the case with arsenic, which when applied to any wound, is apt to inflame the mucous membrane of the stomach.

Varieties of Inflammation.

Inflammation has been divided into the *Acute* and *Chronic*. When it runs a rapid course, when the symptoms are severe, and especially when the general febrile disturbance is considerable, it is said to be *Acute*; when, on the contrary, the inflammation is slow in its progress, when the symptoms are extremely mild, and when the general disturbance is but slight or altogether absent, it is said to be *Chronic*. These terms, however, are to a certain extent arbitrary, it being impossible to fix upon the precise point at which acute inflammation can be said to end and the chronic begin. Inflammation has also been divided into the *tonic* and *atonic*, terms which appear to have reference to the degree of vital power existing in the general constitution or in the part inflamed, rather than to the actual degree of inflammation present.

Inflammation is also said to be of a *Common* and of a *Specific* kind. The term *Common*, as applied to inflammation, is used merely in a negative sense, implying that the disease presents nothing peculiar either in its character, causes, or consequences; whereas the term *Specific*, refers to some peculiarity either in the causes producing the inflammation, or in the constitution of the individual affected with it. Thus the inflammations produced by the poisons of smallpox and syphilis, and the

inflammation of scrofula, gout, and rheumatism, have been called Specific. When inflammation arises without our being able to discover any cause whatever, it is said to be *Spontaneous*.

Constitutional and Local Treatment of Inflammation.

The constitutional treatment is to be regulated chiefly by the form and degree of the accompanying pyrexia, the local treatment by the seat and condition of the inflamed part.

In ordinary cases, the constitutional treatment will chiefly consist in a strict observance of the antiphlogistic regimen, in the employment of various modes of depletion, and in promoting the several secretions and excretions. The extent of depletion necessary, must be determined by the age and constitution of the patient, the intensity of the inflammation, the period of the attack, the importance of the organ inflamed, and by the character of the accompanying pyrexia, as shown by the state of the pulse, the skin, and the tongue, and by the appearance of the blood first drawn. If the patient be young and of a robust constitution, if the inflammation be very acute, if it be seated in an important organ, and especially if the accompanying pyrexia be of a highly sthenic type, as indicated by the hot skin, white tongue, and full and strong pulse, there can be little doubt respecting the propriety of active depletion; and should the blood first drawn present a firm crassamentum, and especially, if it yield a firm white and cupped buffy coat, it will still further justify the practice. As the impression we are desirous of making upon the constitution by venesection, depends upon the rapidity with which the blood is taken away, rather than upon the absolute quantity abstracted, the orifice in the vein ought

to be large, and unless he be very robust indeed, the patient should be placed in the half-erect position, in order that the desired *approach* to syncope may be more certainly induced. Should the general symptoms and local inflammation still continue severe, the venesection must be repeated a greater or less number of times, in quantities proportionate to the effects produced. If any doubt exist as to further general depletion, blood may often be most advantageously taken from the immediate neighbourhood of the inflamed part, by cupping or leeching; whilst in other instances, counter-irritation by means of blisters, setons, issues, and various ointments or liniments, will occasionally prove of considerable service.

Another mode of lessening the general excitement, is by purging, which has the twofold effect of somewhat diminishing the quantity of circulating fluid, and of removing those sources of irritation which result from the bulk or acrimony of the contents of the alimentary canal. It is perhaps the best practice to administer a brisk purge at first, effectually to unload the bowels, and afterwards to maintain a gentle action on them by means of the milder and more cooling laxatives. For unloading the bowels, five or six grains of calomel may be given, followed in a few hours by a brisk dose of senna and salts; or four grains of calomel, with ten of the compound extract of colocynth, or a scruple of jalap or rhubarb, may be substituted; after the operation of any of which, a drachm or more of the sulphate of magnesia may be given dissolved in the compound infusion of roses or in mint-water twice or thrice a day, according to the effect.

The general excitement may also be mitigated by the use of diaphoretics. Of these, antimonials are the best; they tend to diminish the muscular powers of the system,

they lessen the action of the heart and arteries, and promote perspiration and the secretions generally, especially if a slight degree of nausea be induced. Twenty or thirty minims of the vin. ant. tart. may be given in a saline mixture three or four times a day, or it may be combined with a mixture of liq. ammon. acet., to each dose of which, a drachm of magnes. sulph. may be added.

Another class of remedies occasionally employed to lessen general excitement are *refrigerants*. Of these, nitre and the mineral and vegetable acids have been generally preferred. Five to ten grains of nitre, three or four times a day, in any ordinary vehicle; or the mineral acids in appropriate doses may be given. The nitre may with propriety be exhibited with the compound infusion of roses, with or without an additional quantity of sugar. The vegetable acids, however, prove by far the most grateful, especially when given in combination with carbonic acid gas, as found in a common effervescing draught with excess of acid. Such a combination may be allowed as often as necessary, or as common drink.

To the general remedies already mentioned, others will often require to be superadded, with a view to the local inflammation; such as opium, digitalis, and mercury; but especially the latter, which by its specific operation is, after general blood-letting, well known to exert a more powerful influence in controlling inflammation than any other medicine with which we are at present acquainted.

When the accompanying pyrexia partakes more or less of the asthenic or typhoid type, the treatment must be proportionably modified. In such cases, general depletion ought to be employed with the greatest caution and reserve, whilst local bleeding and the other less powerful remedies must constitute our chief resources.

There is a modification of febrile disturbance most frequently occurring after severe injuries, but occasionally after surgical operations, and characterized by great nervous irritation, restlessness, watchfulness, sometimes delirium, and a remarkable diminution of most of the secretions; together with a manifest want of power, as indicated by the brown tongue, and by the frequent and sharp but compressible pulse. Such a state is frequently met with after compound fractures, and is most successfully combated by removing, as far as possible, all sources of irritation, by a pure atmosphere, gentle laxatives, good but bland nourishment, and by the employment of calomel and opium. These two medicines may be given in combination to the extent of a grain each, two or three times a day, or the calomel may be given with five or six grains of the pulv. ipecac. co., or it may be given alone, the opium being administered in the form of glyster. In the latter case, from half a drachm to a drachm of laudanum, or from half an ounce to an ounce of syrup of poppies, may be thrown up with two or three ounces of thin starch.

In this work, it is unnecessary to dwell upon the local treatment of inflammation when situated externally. Local depletion by means of leeches, puncturing in erysipelas with the point of a lancet, fomentations, poultices, cold, evaporating, sedative, or saturnine lotions, need merely be mentioned.

When suppuration takes place, and especially when hectic fever supervenes, endeavour must be made to remove or diminish every source of irritation, to procure repose, and to support the patient's strength. These objects will be best accomplished by gentle laxatives, the mineral acids, opiates, tonic medicines, and by a nutritious bland diet.

When mortification takes place, the constitutional treatment will consist in supporting the strength of the patient by means of good diet, bark, opium, wine, porter, or even brandy, in quantities proportionate to the urgency of the particular case.

Theory of Inflammation.

The fanciful doctrines of Hippocrates and Galen having received their first shock from Paracelsus, founder of the chemical sect of physicians, were afterwards entirely overthrown by the discovery of the circulation early in the 17th century. When to the mechanical and mathematical bias given to men's minds at that period, is added the influence of early impressions, it cannot be a matter of surprise that the medical doctrines of the day should have been made up of a heterogeneous compound of humoral, chemical, mechanical, and mathematical notions, rendered unquestionably more plausible, as well as more intelligible, by the recently acquired knowledge of the circulation.

Such were the views of Boerhaave, who nevertheless, in applying them to the phænomena of inflammation, constructed a theory which rested almost exclusively upon mechanical principles.

According to Boerhaave and his followers, *obstruction* was necessarily present in every instance of inflammation. This obstruction they imagined took place only in the minute arteries, and consisted of arterial blood, whilst they contended that obstruction did not take place in the minute veins, because the blood, however viscid, could not be obstructed in vessels in which it must naturally flow from a narrower into a wider tube. In the arteries, on the contrary, the blood might be obstructed in a vessel

too small to allow of its passage, every effort made by the heart, or *vis a tergo*, to force it through, only tending to impact it more firmly, in consequence of the artery forming a cone, in which the blood flows from the base towards the apex. Besides obstruction, therefore, they considered an increased impulse of the circulation upon the obstructed vessel or vessels as constituting an essential part of all inflammations. The blood was in this way supposed to act upon the obstructed part with a force or violence equal to what would have been necessary to propel that fluid to the extreme parts of the body.

The arterial blood was supposed to cause obstruction either from its mere viscidty, or in consequence of what was called an *error loci*, when they imagined that an individual particle of blood accidentally got into an artery too small to admit of its free passage. In addition to the obstruction, and the violence inflicted by the impulse of the blood from behind upon the obstructed part, they ascribed the local mischief in some degree also to *attrition*, which they supposed to arise in this way: each systole of the heart being succeeded by a reaction of the arteries, such reaction was supposed to be sufficient to force the obstructing particle some way back into a wider part of the tube, but the next systole of the heart again caused it to return to its former situation; so that this removal and return being repeated at every stroke of the heart, injurious attrition between the particles and coats of the arteries, was the consequence. Obstruction they conceived, might take place either in the minute arteries carrying red blood, or in vessels too small to admit the red particles; and accordingly as it took place in one or other of these sets of vessels, the different kinds or species of inflammation resulted. If the obstruction was

situated in the vessels carrying red blood, common phlegmonous inflammation was the consequence; if in the colourless arteries, erysipelas; and if in the most minute of all, what they called *oedema calidum*.

The swelling was supposed to depend in part upon the dilatation of the vessels, and partly upon expansion of the fluids in consequence of the increased heat. The hardness was ascribed to the obstructed blood concreting and extending the mischief by its pressure upon the neighbouring parts. The heat was supposed to be owing to the attrition of the blood against the sides of the vessels, and to the increased quantity of that fluid necessarily thrown upon them in consequence of its not being able to find a passage through the arteries supposed to be obstructed.

The remote causes of inflammation, in accordance with these views respecting its nature, were all ranged under two heads,—whatever tends to lessen the area of the arteries, and whatever tends to thicken the blood. Of the first kind, they reckoned pressure, stretching, and acrid substances; of the latter, heat and violent exercise, which were supposed to thicken the blood by dissipating its thinner parts.

If the impacted matter became so broken down as to be able to pass through the artery in which it was confined, or should this take place from a change induced in the artery itself, resolution was the consequence. If the obstruction proved so considerable as to deprive the vessels beyond it entirely of blood, these vessels were supposed to die and separate; and from their broken extremities certain fluids were poured out, which after dissolving the dead vessels, and undergoing peculiar changes, became converted into pus, thus constituting suppuration. Gangrene was supposed to arise from the sudden rupture

of the vessels, and consequent death of the neighbouring parts. The following therefore is the definition of inflammation according to Boerhaave and his followers: "*Sanguinis rubri arteriosi in minimis canalibus stagnantis pressio et attritus a motu reliqui sanguinis moti, et per febrim fortius acti.*"

Such is a brief outline of the doctrine of Boerhaave concerning the nature of inflammation. From the celebrity of its author, from its apparent simplicity, and from the rational and intelligible rules of practice to which it naturally led, it became the favourite of many of Boerhaave's cotemporaries, and was soon afterwards universally adopted, entirely supplanting every other that had preceded it.

It will at once be perceived that this imposing doctrine of inflammation, is exactly in accordance with the opinions of the humoralists respecting the nature of fever, and that in their views of this disease, the blood and blood-vessels were regarded as little more than a mere hydraulic apparatus, operating according to certain mechanical laws. But what has already been urged against the humoral pathology, when on the subject of fever, is equally applicable in the case of inflammation. The viscosity or lentor of the blood is by no means proved to exist in every case of inflammation; and the grand argument drawn from the appearance of the inflammatory crust or buffy coat is both fallacious and inconclusive. It presents itself in certain states of the body, when no inflammation whatever exists; and we not unfrequently fail to observe it in most decided attacks of active inflammation. As to the *error loci* so much dwelt upon by the mechanical humoralists, although it is undeniable that such an occurrence occasionally takes place, as in the suffused eye, yet when it

does appear in inflammation there is every reason to believe that it is rather an effect than a cause of that morbid state.

It is unnecessary to trace the steps by which medical science advanced from Boerhaave to the time of Cullen, or to recapitulate the circumstances which led the latter to discover and expose the fallacy of the mechanical doctrine of the former. Cullen no longer regarded the blood-vessels as a system of passive tubes, but ascribed to them vital properties altogether distinct from their mechanical structure, or in other words, he attempted to apply his nervous doctrine to explain the phenomena of inflammation. He, like the humoralists, supposed the existence of an obstruction, but made that obstruction to depend upon a spasm affecting the extreme vessels of the inflamed part: he assumed that some causes of inequality in the distribution of the blood, might throw an unusual quantity of it upon particular vessels, and arrived at the conclusion that "a spasm of the extreme arteries supporting an increased action in the course of them may be considered as the proximate cause of inflammation, at least in all cases not arising from direct stimuli applied; and even in this case the stimuli may be supposed to produce a spasm of the extreme vessels."

More recently, the chief dispute amongst pathologists has been whether the action of the arteries of an inflamed part is increased or diminished,—whether their contents move with greater or with less velocity than natural. Some have contended for the former; whilst others, perceiving the difficulty of reconciling the existence of an increased action with the manifestly increased size of the contractile arteries, have espoused the latter opinion.

In illustration and support of these respective views,

numerous experiments made upon the lower animals, aided by the microscope, have been adduced. Such experiments, however, are from their very nature extremely equivocal and deceptive, and in the present instance have led to nothing very satisfactory, inasmuch as they have in different hands been attended, apparently, with very different results.

In all the theories of inflammation thus briefly alluded to, almost exclusive attention has been directed to what may be called the mechanical condition of the blood-vessels of the part,—their size, and the degree of force exerted by them upon their contents. It nevertheless appears extremely difficult to reconcile so circumscribed a view of the matter, with what we know respecting either the causes or the consequences of inflammation. Transient or permanent states of the blood-vessels, not very obviously different in a mechanical point of view from that of inflammation, are repeatedly produced without any evidence whatever of inflammation of any kind resulting; whilst the merely mechanical condition of the blood-vessels is very far indeed from explaining why the progress, the effects, and the treatment of inflammation should so widely differ according to the nature of the cause which produced it.

Satisfactorily to account, as well for the ordinary effects as for the several varieties of inflammation, it would appear necessary to look for something beyond the mechanical condition of the blood-vessels, a something, of which we may suppose the mechanical condition of the blood-vessels to be a mere effect and indication. This something, probably consists in a diseased function of the ganglionic system of nerves of the part. If we inflict violence on any ordinary part of the body, the first

sensible effect is pain. This pain, we are bound to believe, uniformly and exclusively results from the violence done to the nerves of sensation, for when inflammation takes place in a paralysed limb there is no pain; and as in a paralysed limb we may have all the phenomena of inflammation except pain, it may with some show of fairness be concluded that neither pain nor the influence of the cerebro-spinal nerves is essential to that morbid condition, whatever power certain states of these nerves may occasionally display in producing it, or in modifying it when excited by ordinary causes.

The diseased function of the ganglionic nerves of the part is unquestionably most obvious, and is probably of greatest moment, in the arteries; it nevertheless still remains to be shown what share the veins and absorbent vessels have in the process of inflammation, and whether the diseased action does not in every instance originate in a system of vessels interposed between the arteries and veins, and to which the name of capillaries has been more strictly applied. As it regards the arteries, observation and experiment render it probable that in the first instance their sensibility to the stimulus of the blood is increased, that they are in consequence thrown into excessive contractions, and that after a time their contractility is impaired, or they become weakened and dilated. But besides the mechanical changes induced in the arteries, we find their vital or chemical functions to deviate greatly from the natural state, so that instead of healthy secretion and nutrition, we have serum, pus, and organizable albumen thrown out, together with a remarkable loss of cohesion in the inflamed tissue; whilst in some instances the functions of the arteries entirely cease and give rise to mortification or death of the part.

Upon the whole, we think it not improbable that inflammation consists essentially in a diseased function of those organs which derive their nervous endowments from the ganglionic system; that it varies in degree with the intensity of common causes; that it varies in kind when produced by specific causes; and that it may be so mild as not to extend its influence beyond the part affected, or so severe as to excite in the whole of the organic nervous system that modification of general disturbance which we call fever.

SIMPLE INFLAMMATORY FEVER.

This constitutes the Synocha of Cullen, and was regarded by him an idiopathic fever, because no primary local affection is found necessarily associated with it. But although it be true that this form of fever is occasionally met with independently of catarrhal or other local inflammation, such cases are of comparatively rare occurrence. We have therefore considered it preferable, in a practical point of view, to defer its description till we came to treat of the individual phlegmasiæ or inflammations, to which it is closely allied, and with which it is so frequently combined.

It usually commences with chilliness, shivering, and loss of appetite, quickly succeeded by remarkable heat and dryness of the surface, a flushed face, suffusion of the eyes, pain or throbbing at the temples or within the head, pain in the loins, aching, uneasiness, and general soreness over the whole body, great restlessness, a frequent, full, and hard pulse, a white and often dry tongue, thirst, occasionally nausea or sickness, constipation, high-coloured urine, great watchfulness, and sometimes delirium

during the night. These symptoms are as uncertain in their duration as in their intensity. In some rare instances they will pass away in the course of twenty-four hours, constituting an ephemera, or fever of a day: much more commonly, however, they last from three to six or eight days, and either subside gradually, or undergo a more sudden change for the better on the appearance of an universal perspiration, a copious sediment in the urine, or an herpetic eruption about the lips. In less favourable cases, the disease may proceed to inflammation in some part or organ, most frequently the brain, lungs, or intestines.

Causes.—The disease is most frequently met with in winter, spring, and autumn, and in persons of from sixteen or eighteen to forty years of age. Those of a plethoric and irritable habit seem to be most strongly predisposed to it; nevertheless we are often unable to assign any obvious reason why certain individuals should be more susceptible of it than others, and then it is said to depend upon idiosyncrasy.

As *exciting* causes, may be enumerated violent passions of the mind, great bodily exertion, excesses in eating or drinking, and long-continued exposure to the heat of the sun; but by far the most manifest and frequent exciting cause of this form of fever, is unquestionably *Cold*, especially when combined with moisture, and applied to the body either partially, by a current of air, or by getting wet-footed; or generally, by long exposure, by getting wet through with rain, or accidental immersion in water. This general or partial application of cold is also observed to act most certainly in an injurious manner, when the body has been previously over-excited and in a state of perspiration.

Such applications of cold not only produce the general state of fever now under consideration, but prove moreover by far the most frequent cause of what have been called the Phlegmasiæ, in which we have a combination of general febrile commotion with some local inflammation. This circumstance of the most frequent exciting cause of inflammatory fever and of the phlegmasiæ being the same, will sufficiently explain the close alliance which so obviously exists between them, and why we should at one time have merely general fever, and at another, general fever with local inflammation, according to the duration and intensity of the cold, and according to the susceptibility of inflammation existing in particular individuals or in particular organs.

Diagnosis.—This disease will be found to differ from common Continued fever, chiefly in the abruptness of its attack, in the early development of acute vascular excitement, in its shorter duration, and in the comparatively inconsiderable loss of muscular and general vital power, which attends or results from it. Nevertheless, in some rare instances it has appeared to pass into a form of fever not distinguishable at least from common Continued fever.

It is much more likely to be confounded with the acute febrile disturbance, which so commonly precedes the eruption of the exanthemata. In the premonitory fever of smallpox, the acute pain in the lower part of the back, the tenderness at the scrobiculus cordis, and nausea or sickness at stomach, will often enable us to anticipate the disease, especially if the patient be young, if he have not already passed through the disorder, and if it is known to be prevalent at the time. In the eruptive fever of measles, the catarrhal symptoms, and in scarlet fever the early

affection of the throat and speedy appearance of the rash, will seldom leave us long in doubt as to the nature of the disease.

The *Prognosis* is uniformly favourable, inasmuch as however violent may be the symptoms of vascular excitement, the general powers of the system are usually so little impaired, that we can freely employ the means which we know to be capable of subduing them. It is only when the disease proceeds to involve particular parts or organs in inflammation, that danger is to be apprehended; and then, of course, it will be proportionate to the intensity of the inflammation, the importance of the part or organ inflamed, and the constitution or predisposition of the patient.

Treatment.—Some cases are so mild as to require little more than a short confinement to bed, mild laxatives, and some gentle diaphoretic or refrigerant medicine, with tepid or cooling drinks, such as tea, barley-water, tamarind whey, apple-tea, lemonade, or the common effervescing draught.

When the vascular excitement runs high, when the patient is young and plethoric, and when the pain in the head and limbs is considerable, a moderate bleeding from the arm will often afford much relief, and may be repeated after a time, should the urgency of the symptoms appear to require it. After this a brisk purge of five or six grains of calomel, with or without four or five of pulv. antimonialis, may be given, followed in three or four hours by a dose of senna and salts; after which, the bowels may be maintained in a free state, either by an occasional repetition of the purge, or by a drachm of the sulphate of magnesia given three or four times a day in an ordinary vehicle, or in a mixture of liq. ammon. acet. In the subsequent

part of the treatment, either diaphoretics or refrigerants may be employed. If the former, the liq. ammon. acet. mixture may be given, with twenty or thirty min. of antimonial wine every six hours; or if the latter, the compound infusion of roses may be allowed for common drink, with or without a few grains of nitre; or the effervescent draught may be substituted, and almost to any extent the patient pleases.

Under such simple treatment, and an observance of the antiphlogistic regimen, patients will generally become convalescent in a few days, without any inconvenience beyond some inconsiderable loss of flesh and strength.

When the symptoms of excitement have been moderate, the more stimulating diaphoretics, such as, white wine whey; hot possets; or, the tinct. camph. comp., to the extent of a drachm, with hot gruel taken at bedtime so as to excite perspiration, have sometimes been followed by a more or less complete solution of the fever. Such remedies, however, are more equivocal than those previously noticed, and when preferred should be tried with caution, and be assisted by the use of the hot pediluvium and a warm bed.

CATARRH.

Influenced by his views of nosological arrangement, Dr. Cullen removed catarrh from the phlegmasiæ, and placed it amongst the profluvia or fluxes. It is, of all inflammatory diseases, that which is most frequently met with in this climate, where the causes which give rise to it are so prevalent and unavoidable that probably no one during a single twelvemonth entirely escapes a greater or less degree of some one of its many modifications. It

comprehends the *Distillatio* and *Gravedo* of Celsus, and is popularly known by the name of a defluxion, or a common cold.

In its most exquisite form, it may be said to consist in an inflammatory condition of the mucous membrane of the nose, eyes, frontal sinuses, fauces, trachea, and bronchial tubes; generally attended with pyrexia; for the most part sporadic; but occasionally epidemic, when it receives the name of influenza, and is by some supposed to be contagious.

It usually commences with a sense of weight and occasionally dull pain about the forehead, accompanied or speedily succeeded by dryness and stuffing of the nose, together with a sense of tickling which excites sneezing or coughing; the eyes next begin to weep, and an increased excretion takes place from the nose, of a thin transparent fluid, having a saline taste, and fretting or excoriating the upper lip and other parts with which it comes in contact; this increased excretion gradually extends to the fauces, trachea, and bronchial tubes, occasioning rawness and soreness in all these parts, and exciting cough, which is attended with a slight expectoration of thin transparent mucus. The rawness and soreness appear to affect the whole course of the trachea and bronchi, but are in general most severely felt at the top of the chest between the junctions of the clavicles. In the early stage of a severe attack, the soreness is sometimes so painfully aggravated by the cough, that the patient feels as if the tender inflamed membrane were actually torn by the violence at each effort. Along with these symptoms, the patient often experiences stiffness and considerable tenderness of the skin around the nose and eyes, pain and rigidity in the muscles of the neck,

and an increase of the fullness and weight about the forehead, constituting what has been called *gravedo*; he very commonly complains of weariness, aching of the limbs, and a sense of soreness or uneasiness over the whole frame; he is liable to occasional chills, especially felt along the course of the spine; he manifests a peculiar susceptibility of the impression of cold, and although the surface is actually dry and hot to the feelings of another person, nevertheless complains of chilliness, and when not confined to bed eagerly draws near the fire. The pulse is accelerated, the thirst considerable, the appetite for the most part greatly impaired, the tongue covered with a tenacious mucous or whitish fur, and the febrile symptoms are wont to suffer an exacerbation in the evening, with a remission towards morning.

Commonly in two or three days, the discharge from the inflamed membrane, which was before thin and acrid, begins to get more consistent, viscid, opaque, and more bland; the fever and general irritation abate; the mucus from the nose becomes thick, more friable, and of a green or yellow colour; a similar matter is rejected more or less copiously from the bronchi; the inflammation and swelling of the membrane subside; the patient again breathes with freedom; the cough and expectoration gradually disappear, and the patient is generally in a short time restored to perfect health.

As already observed, the symptoms enumerated are those which characterize acute catarrh in its most exquisite form; the inflammation, however, of the mucous membrane may not only vary in degree in different cases, but may be much more limited in extent, being probably confined to the nose, to the eyes, to the mouth, to the fauces, or to the trachea and bronchial tubes. When

confined to the fauces it most frequently assumes the form of *cynanche tonsillaris*; when to the larynx, it constitutes *cynanche laryngea*; and when to the trachea and bronchial tubes, *bronchitis*. In each of these three instances, however, the inflammation usually proves more severe, appears to extend more deeply, and is altogether more protracted in its course, so that they are regarded as distinct diseases and will receive a separate description.

The other modifications are so slight and unimportant that it will be sufficient briefly to notice them at present. When the inflammation is confined to the Schneiderian membrane, it constitutes what has been more strictly known by the name of *coryza*. In this case, the general indisposition is very inconsiderable, the febrile symptoms being so slight as to pass unperceived by the patient; the appetite is little if at all affected, and the principal inconvenience results from the necessity of frequently applying a pocket handkerchief. There is, however, for the most part, some degree of soreness about the nostrils and upper lip, occasioned by the acrid discharge, which is often exceedingly copious, together with sneezing and a slight sympathetic cough.

There is another form of catarrhal complaint which has hitherto attracted little notice, but which merits attention, not because it is in itself of a character calculated to inspire the least alarm, but because it may be, and probably often has been, a source of much uneasiness, in consequence of being mistaken for something else. In this instance the inflammation appears to be chiefly confined to the internal mouth, constituting what may be called *catarrhal stomatitis*. The whole of the mucous membrane appears highly injected, and sometimes slightly aphthous, the gums are red, swollen, and tender, there

is occasionally a slight fullness about the parotids, and not unfrequently a greater or less degree of salivation; indeed in some instances the salivation has been profuse, and has been accompanied by a fœtor exactly resembling that arising from mercury. There is some, but seldom much, constitutional disturbance, and the patient generally gets well in a few days.

What may be regarded as a modification of catarrh is a slight and chronic inflammatory condition of the throat, affecting more especially the uvula, which it causes to become relaxed and elongated. This elongated uvula is apt under such circumstances to fall down towards the epiglottis, and thereby to excite a cough, which often proves exceedingly troublesome to the patient. This cough is sometimes slight, but at other times extremely severe; unless complicated with bronchitis it is usually unattended by any expectoration, except a little mucus occasionally torn from the throat by the violence of the cough. As this cough will sometimes last with short intermissions for many months, or even years, when its cause is unfortunately overlooked, it is well to make it a rule never to omit a careful examination of the throat in every case of obstinate cough, and especially when unattended by expectoration.

It frequently happens in the progress of an ordinary catarrh, that an *herpetic eruption* breaks out about the lips without any simultaneous change in the general condition of the patient; it is nevertheless occasionally attended or presently succeeded by a manifest relief to the febrile symptoms. On the other hand, many persons never pass a winter without experiencing repeated returns of this eruption, the only inconvenience being the soreness and slight deformity which it occasions for a few days. Her-

pes labialis, however, now and then exhibits in its mode of attack and in its progress a good deal of the character of a common exanthematous disease, being preceded for some days by an acute febrile state, which it would be quite arbitrary to designate either catarrhal or simple inflammatory fever, and being immediately succeeded by as remarkable a diminution of the febrile excitement as is observed in an ordinary case of smallpox.

Raucedo, or a hoarseness, not unfrequently forms a mere part or symptom of a more general catarrh; in other instances we find individuals labouring under hoarseness without experiencing even cough or any other catarrhal symptom whatever.

Influenza, or Epidemic Catarrh.

The general symptoms of influenza differ little from an ordinary catarrh, the chief peculiarities of influenza being the surprising extent to which it usually spreads, whenever it has once appeared; the abruptness of its attack; and the great rapidity with which its symptoms occasionally become severe. From an early period down to the present time, we find the history of the complaint as described by writers, presenting but little variety, except as it regards the extent and severity of the respective epidemics, and the predominance of some particular symptoms: thus, the influenza of 1781-2 spread over nearly the whole of Asia and Europe, and spared neither age nor sex, so that three fourths, and in some situations four fifths, of the whole population were affected with it. The influenza of 1762 was more severe than that of 1802: the latter was almost uniformly attended with a distressing pain and severe sense of constriction in the forehead, temples, and sometimes over the whole face, accompanied by a sense of

soreness about the cheek-bones under the muscles; whilst the epidemic of 1762 was distinguished by a most intense sense of heat, extending in every instance down the whole course of the trachea, and occasionally by remarkable and sudden lassitude, violent fever, and most distressing pain in the head and limbs, without the latter symptoms being followed by any considerable pulmonary affection. The epidemic of the present year, 1837, has been chiefly remarkable for its general severity; the great number of persons of all ranks and conditions attacked by it; its rapid fatality in the aged and in those who had previously suffered from pulmonary disease, or from organic lesions of the heart; a remarkable loss of strength, and intolerance of depletion in uncomplicated cases; and its frequent association with pneumonia, pleurisy, rheumatism, oppression of the brain, and in some instances, pericarditis.

Causes of Catarrh.—The causes which predispose to catarrh are, individual peculiarity of constitution; a delicate and irritable habit; and above all, a preceding attack. The common *exciting* cause, is unquestionably cold, applied either to the body generally, or to the head, neck, and chest in particular, and especially if accompanied by damp or moisture, as from getting wet-footed or from being caught in a shower of rain and getting wet through. Sudden or considerable alternations of temperature, either from heat to cold or from cold to heat, are also exceedingly favourable to its production. Some persons are liable during summer, and especially at the period when grass is in bloom, to experience a modification of catarrh, attended with considerable irritation and discharge affecting the eyes, nose, and bronchi, and with a good deal of dyspnœa. This occasionally recurs annually in the month

of May or June, and has been attributed to a something emanating from the flowering grass. It has received the names of Catarrhus æstivus and Hay Fever.

Cause of Influenza.—There have been three opinions respecting the cause of this distemper. According to some it depends upon certain conditions of the ordinary sensible qualities of the atmosphere; according to others, it results from a latent epidemic influence; whilst a third party maintain that it is both epidemic and spreads by contagion. As the disease has prevailed under every variety of season, climate, and locality, there can hardly exist a doubt of its connexion with some inscrutable epidemic condition of the atmosphere; but whether it be at the same time communicable by contagion is a question not yet satisfactorily determined.

Morbid Appearances.—In those who die with acute inflammation of the air-passages, portions of the mucous membrane are generally found of a vivid red colour, from fine injection of its blood-vessels; thickened, and perhaps somewhat more consistent than natural; whilst, the bronchial tubes contain a greater or less quantity of a secretion similar to that expectorated during life. The appearance of the membrane, however, is so much modified by the state of the patient's constitution, by previous attacks of the disease, by the length of time the body has been dead, and probably even by its position after death, that little reliance can be placed upon it as a test of the intensity of previous inflammation.

Diagnosis.—The symptoms of acute catarrh are so striking and obvious, that it is scarcely possible to mistake the disease for any other. Almost the only exception is the eruptive fever of measles, which occasionally bears a very close resemblance to an attack of catarrh. The

age of the patient, however, and the history of the case, will pretty uniformly enable us to decide; and if any doubt exist, the appearance of the rash will soon entirely remove it. It is chiefly with a view to detect any accidental complication of pneumonia or pleurisy that the practice of percussion and auscultation becomes necessary. Percussion yields a natural or clear sound everywhere, and auscultation detects the mucous, sonorous, or sibilant rattle, sometimes one, sometimes another, and very commonly two or all of them. As it regards the exploration of the chest, one of the most striking features of catarrh is the frequent combination of a clear sound on percussion with absence of respiratory murmur on auscultation of the same part. This arises from the air-cells still containing air, whilst mucous secretion obstructs the tubes which lead to them. Hence the respiratory murmur is in general observed frequently to cease and return under such circumstances, and is sometimes instantly restored on the patient coughing, the cough having the effect of removing for a time the obstructing mucus.

Prognosis.—When acute catarrh attacks persons who are young and of good constitution, little or no danger is to be apprehended. If, however, the patient be advanced in years, if the constitution shall have been impaired by intemperance, if the chest be very much contracted or deformed, and especially if a severe attack supervene upon a chronic inflammatory state of the bronchial membrane, the result may be fatal; the patient probably sinking partly from exhaustion, and partly from suffocation, in consequence of no longer being able to expectorate the mucous secretions which obstruct the bronchial tubes. When the disease is of the epidemic kind, the prognosis is commonly, *cæteris paribus*, more unfavourable, and is

to be determined by the character of the particular epidemic, by the severity of the individual attack, and by the success observed to result from remedies in the first few cases. When in the progress of catarrh we have pneumonia or pleurisy supervene, the danger will of course be increased in proportion to the extent and severity of the complication. Independently, however, of immediate danger to the life of the patient, it must be borne in mind that one attack of catarrh always strongly predisposes to another, and that asthmatic and phthisical subjects not unfrequently have their respective predispositions excited to actual disease by it.

Treatment.

The treatment is nearly the same in common and epidemic catarrh. In the latter, however, we must be guided in some measure by the particular character of the prevailing epidemic and by the results of our early experience. In a large proportion of cases of ordinary catarrh, little more is required than confinement within doors and abstinence for a few days, together with a liberal use of diluent or cooling drinks to promote perspiration. In every instance, whether of common or epidemic catarrh, the principal objects of treatment are to subdue febrile and inflammatory action, and to allay irritation; for it is only by such means that we can hope to mitigate the cough and facilitate expectoration.

Should the febrile symptoms run high, should the constriction of the chest be considerable, and especially if the disease show a tendency to pass into pneumonia or pleurisy, bloodletting may be had recourse to with safety and advantage, to an extent regulated by the severity of the attack and the constitution of the patient. In ordinary

catarrh, however, bloodletting is seldom required; it has never been employed to any great extent in influenza, and indeed in some instances of the latter it has been found inadmissible from the great and sudden prostration of strength observed to follow its use.

With the further view of subduing febrile excitement, some of the more gentle cooling laxatives may be given. Any of the neutral salts in moderate doses answer the purpose exceedingly well. Occasionally, however, it may be well to give in the first instance three or four grains of calomel with four or five grains of antimonial powder, followed in a few hours, if necessary, by a dose of senna and salts. This combination seldom fails to act freely upon the bowels, and sometimes has appeared to promote the secretions generally, and that from the skin in particular. There exists so peculiar a consent between the surface of the body and the lining membrane of the air passages, that in general, whatever promotes the secretion of the former pretty uniformly proves beneficial in inflammatory conditions of the latter; hence we find that diaphoretics have at all times formed a most important part of the treatment of catarrh. In severe cases 25 or 30 minims of of *vin. antim. tart.*, or as much *vin. ipecacuanhæ*, may be given in the mixture of *liq. ammon. acet.* every four or six hours, their diaphoretic effects being promoted by the use of the pediluvium and warm gruel, or diluent drinks, and confinement to bed. Another antiphlogistic remedy, often of great power at the commencement of the disease, is an emetic, particularly of the antimonial kind, which has the effect of lessening the action of the heart and arteries, and of promoting most of the secretions, especially perspiration. It is seldom that local depletion is required, but when at a later period of the disease

there exists a suspicion of a pneumonic or pleuritic tendency, or when the affection of the mucous membrane continues with unusual severity, a blister to the chest has appeared in many instances to be followed by considerable benefit.

In attempting to allay irritation, the object in every instance is to mitigate the violence of the cough, and thereby to obviate the additional injury inflicted by it upon the inflamed parts. But not only do the means for allaying irritation accomplish this, but by allowing a larger quantity of secretion to accumulate in the bronchial tubes during the intervals of coughing, it is expectorated with greater facility when the cough is repeated. Accordingly the remedies for allaying irritation will necessarily vary with the period of the disease. At first, the irritation depends upon the highly inflamed state of the mucous membrane, and the presence of its acrimonious secretion. The best means, therefore, for allaying irritation at this period will be those already pointed out as calculated to subdue inflammatory action; besides which, we can do little more than add a little mucilage and syrup to our diaphoretic mixture, or substitute for it, a mild demulcent, to which may be added some form of anodyne.

A common demulcent is the oily emulsion, which may be made with half an ounce of *ol. olivæ*, rendered miscible with about seven ounces of water by means of half a drachm of *liq. potas. carb.*, and to which may be added a little syrup of *tolu*, and to each dose of two table-spoonsful about 20 minims of tincture of *hyoscyamus* or a drachm of syrup of poppies. Instead of this form of demulcent, the *spermaceti* mixture is occasionally given; but by far the most elegant as well as the most grateful demulcent is the *mist. amygdalæ*, to each dose of which

may be added either of the above anodynes, with or without five or six grains of nitre. As soon as the febrile and inflammatory symptoms have been subdued, when the skin becomes moist and the heat moderate, and even from the beginning in mild cases, the more powerful anodynes prepared from opium may be given.

The pulv. ipecac. comp. in doses of five or six grains night and morning will often answer the purpose exceedingly well. If, however, there exist any doubt about the propriety of this more powerful opiate, a very excellent substitute will be found in four or five grains of extr. hyoscyami or extr. conii, with half a grain or a grain of ipecacuanha, two or three times a day. In other cases, three or four grains of the extr. papav. given with the ipecacuanha; or a drachm of tinct. camph. comp. with each dose of the saline or demulcent mixture, will be found of much service. In short, in proportion as the febrile and inflammatory symptoms are mild, the stronger opiates may be exhibited with greater freedom. The reputed expectorants are rarely admissible or beneficial in acute catarrh; it is in the more chronic forms of bronchial inflammation that they are found of service. The use of Mudge's inhaler, when not distressing to the patient, has sometimes afforded relief, and appeared to promote expectoration. It is only in the most severe forms of catarrh, and particularly when there is a marked tendency to pneumonia or pleurisy, that in addition to general and local depletion the free use of mercury may become necessary; it is in such cases, too, that digitalis often proves a valuable medicine.

After an attack of catarrh, great precaution is necessary to avoid a relapse or return of the complaint. The patient, therefore, should be directed to wear flannel next

his skin, to preserve his feet warm and dry, to avoid damp and especially night air, to shun sudden vicissitudes, and perhaps defend the chest by the additional covering of a plaster or a prepared hare-skin.

ACUTE BRONCHITIS.

In bronchitis, which is the most frequent of all catarrhal affections, and that which presents the greatest variety, the inflammation from the commencement is seated chiefly or exclusively in the bronchi and their ramifications. The acute form of it may or may not be preceded by the usual premonitory symptoms of a febrile disorder, and is commonly first announced by a feeling of rawness, roughness, or tickling about the throat, which excites a slight cough with little or no expectoration. As the disease advances, febrile symptoms of reaction more or less severe supervene, the skin becoming hot, sometimes dry, at other times moist, the tongue white and furred, with thirst, high-coloured urine, a frequent, full, and perhaps strong, but seldom a hard pulse: the local feeling of irritation appears to extend down the trachea and bronchi, aggravating the cough, and producing hurry of respiration, wheezing, and a sense of constriction, heat, and soreness within the chest. The expectoration now becomes more copious, and consists at first of a thin transparent mucus mixed with saliva, and in some rare instances faintly tinged with blood. So long in general as the expectoration preserves the pituitous character, the febrile symptoms are liable to be severe and the cough very distressing, occasioning not only an aggravation of the internal soreness, but flying pains or stitches apparently affecting the parietes of the chest, together with weariness, and some-

times even great pain and tenderness felt in the muscles, and especially in the abdominal muscles, where they are attached to the ribs. During the fits of coughing, the patient's face appears flushed, his eyes injected or suffused with tears, and he experiences a fulness, giddiness, or splitting pain in the head, and especially in the forehead. Commonly in a very few days, the sputa change their character, becoming whitish, more consistent, and viscid, but variable in quantity, and often expectorated with considerable difficulty; the general symptoms and soreness of the chest, though perhaps somewhat mitigated, still continue severe; the dyspnœa and wheezing are often very great, with a livid or dingy paleness of the face, livor of the lips, and occasionally a suffused or watery aspect of the eyes, and a peculiar shining moisture beneath the eyes and about the forehead. When such acute cases terminate favourably, the cough gets less violent and is less frequently repeated; the expectorated matter changes its character, becoming thicker and more friable, assumes a greenish or yellowish colour, and is rejected with greater freedom and facility; the febrile symptoms subside, the oppression of the chest and hurry of respiration are relieved, and the patient is restored to health probably in a week or ten days, or in a period varying from this to four or six weeks. When, on the contrary, the disease proves fatal, the obstruction in the bronchial tubes becomes so great, and the respiration so impeded, that the patient experiences a most distressing sense of oppression and threatening suffocation, his face gets livid, his lips purple, the repeated efforts to breathe exhaust his strength, he can no longer cough up the bronchial secretion, it rattles in the tubes, the pulse sinks, becoming small, frequent, and feeble, the extremities get cold,

clammy sweats break forth, and the patient dies ;—death in some instances being preceded for some hours by a state of asphyxia.

The description given, may be regarded as that which is applicable to the most exquisite form of a first attack of acute bronchitis. In practice, we meet with almost infinite variety, both as it regards the acuteness of the inflammation and the extent of the bronchial membrane which it happens to involve ; we observe a corresponding diversity in the general symptoms and in the quantity, quality, and successive changes which take place in the expectorated mucus ; and we have each individual case more or less modified by the age and constitution of the patient. In a large majority of the instances even of a first attack, the general symptoms are moderate, and the dyspnoea and oppression within the chest such as to excite little or no apprehension. In such cases the matter expectorated does not, by any means always present the character and successive changes which have been described ; in some it is scanty, in others copious ; in some the early secretion appears to be less irritating than usual ; in others a partial change only from the thin and transparent, or viscid and transparent, to the thick and yellow takes place, whilst it not unfrequently happens that the secretion entirely ceases as the inflammation subsides without any material change in its character having been observed.

In some persons, and especially those of a cold, lax, and leucophlegmatic temperament, acute bronchitis gives rise to symptoms differing very considerably from those described. The disease probably commences in the usual way, but instead of the bronchial secretion passing through the ordinary changes, it permanently continues thin, trans-

parent, and stringy, and is poured out in considerable and sometimes immense quantity. In this form of the complaint the dyspnœa is usually great, and the cough comes on in violent paroxysms.

By far the most dangerous and distressing form of acute bronchitis is unquestionably that in which the inflammation supervenes upon bronchi, the mucous membrane of which, is already in a state of chronic disease. In such cases the progress to symptoms of great urgency is at all times rapid, especially when it attacks those who have a tendency to spasm of the bronchial tubes, and when it occurs, as it often does, in persons of advanced life and of enfeebled or vitiated habit of body. Some cases of this kind, constitute the worst forms of what have been called suffocative catarrh, the secretion often being exceedingly abundant, consisting partly of a thick yellow puriform mucus habitually expectorated by the patient, and partly of a thinner and more transparent matter, apparently the product of the more recent inflammation.

In bad constitutions, acute bronchitis sometimes speedily gives rise to a copious secretion of thin puriform matter, which seems to produce, or at least is attended with, a considerable sense of soreness or irritation within the chest, and a modification of febrile disturbance resembling hectic. In some rare instances the expectoration has an extremely fœtid odour, without either discoloration or any other indication whatever of gangrene of the lung; and in still rarer cases, the expectoration from being yellow and puriform has suddenly become so intimately mixed with blood as to assume a more or less deep mahogany colour. These latter characters, however, of the expectoration are most frequently observed in the less acute forms of bronchitis.

Morbid Appearances.—In the bodies of persons who have died of acute bronchitis, the mucous membrane has been found of a vivid red colour from finely injected blood-vessels, thickened, and somewhat more consistent, but occasionally less so than natural, the tubes themselves containing a greater or less quantity of secretion similar to that expectorated during life. These appearances may extend to a considerable portion of both lungs, they may be limited to a single lung, or to portions only of a single lung, but are pretty uniformly most apparent about the divisions of the larger bronchi. Both the colour and the consistence, however, of this mucous membrane depend so much upon the previous condition and circumstances of the individual that they are not only extremely variable, but furnish a very equivocal evidence of the intensity of the disease. The heart, especially the right auricle, the liver, and brain, and sometimes the lungs themselves, are found more or less gorged with dark blood. With these appearances we not unfrequently discover complications of œdema, pneumonia, and pleurisy, or if the patient have suffered previous attacks either of acute or chronic bronchitis, the lungs are probably affected with emphysema.

Chronic Bronchitis.

The varieties observed in chronic bronchitis, correspond in some measure, with those of the acute form of the complaint; whilst we find each variety differing in degree in different persons, or even in the same persons at different times. Perhaps the most striking, if not the most common form of chronic bronchitis, is that which is usually met with either as a sequel of an acute attack in the adult, or of whooping-cough in children. It is characterized by cough and a more or less copious and indeed

sometimes profuse expectoration of a thick yellow or greenish puriform mucus; the shortness of breath, wheezing, and oppression in the chest vary with the extent of the disease, and are for the most part readily aggravated by exercise or exertion of any kind; the countenance is generally pale, sometimes with a faint livid tinge, especially observable in the lips, and the eyes often present a watery and prominent appearance; the patient is liable to suffer from giddiness or even severe shooting pains within the head; there is seldom any very appreciable febrile disturbance, except now and then a very slight accession towards evening; the pulse is sometimes small and weak, but, most commonly, full, soft, and large, yet compressible and without any considerable increase of frequency; there is little thirst, and the appetite is often quite natural. In this state, a patient will remain for a number of weeks, months, or even years, and then get quite well, or will so far recover as merely to be liable to occasional attacks of the slighter forms of the disease. In other instances, he in a great measure recovers in summer, but continues perhaps each succeeding winter, to experience a considerable aggravation, till at length the bronchial membrane and the lungs themselves become so deranged and oppressed, that in one of these casual attacks the strength of the patient fails; he can no longer expectorate with freedom; the mucus rattles in the tubes; a due supply of air being no longer admitted, the blood does not undergo the natural changes in the lungs; the lips and face turn livid; the anguish and sense of suffocation are extreme; he falls into a state of asphyxia or apoplectic stupor, till the vital powers are completely exhausted, and he dies. In other instances, the cough and expectoration proceed, hectic supervenes, the patient gra-

dually emaciates, and dies with all the usual symptoms of phthisis pulmonalis. The cases which terminate in this way, are most frequently the result or sequel either of an acute attack in the adult, or of whooping cough in children.

We sometimes observe on examining the matter expectorated, that the thick yellow puriform mucus is mixed with, or rather swims in, a thin transparent stringy fluid; but in some cases, and especially in aged, leucophlegmatic, and broken-down gouty subjects, the expectoration consists entirely of the latter, and is at the same time exceedingly copious. In this form of the complaint, which has been called chronic pituitous bronchitis or catarrh, the dyspnoea is considerable, and the cough usually comes on at rather distant intervals in the day or night, the matter expectorated at each paroxysm, being commonly very abundant, and amounting in some instances to as much as two or three pints or even more in twenty-four hours.

In this, and probably in every cold and changeable climate, there are few persons who have their bronchial membrane so entirely exempt from all chronic inflammatory disease, as to furnish no indication whatever of obstruction, on being carefully tested by auscultation. But even when manifest to auscultation, it may not be so considerable as to occasion any inconvenience to the patient; in other cases it is such as to give rise to some hurry or oppression of the breathing upon any exertion, on making an ascent, or on exposure to cold, or to smoke or dust; whilst in more aggravated cases, we have not only habitual shortness of breath, but also cough and slight expectoration. Such forms of bronchial disease are extremely common; they will occasionally last with little

variation for years, and are often spoken of indiscriminately under the general name of Asthma. When seated in the smaller bronchial tubes, the scanty secretion is generally remarkably viscid, and when accumulated into small globular masses constitute the pearly expectoration of modern writers. From the viscosity of the sputa and the swelling of the lining membrane of the smaller tubes, the breathing is often oppressed to a degree quite disproportionate to the severity of the inflammation, the dyspnœa often coming on suddenly in paroxysms which last from a few minutes to some hours, and either gradually subside or are speedily relieved on the supervention of a more or less copious expectoration. Such paroxysms render it probable that chronic inflammation when set up and continued in the smaller bronchial tubes, predisposes to or even excites spasm; and at all events, when such chronic cases occur in persons of a really asthmatic habit, or who are known to be disposed to spasm of the bronchial tubes, the paroxysms of difficulty of breathing are sometimes extremely violent, and especially so when a more or less acute attack of bronchial inflammation happens to be superadded to the original chronic disease.

Morbid appearances.—In the bodies of those who have died whilst labouring under chronic bronchitis, we most frequently find the mucous membrane of a dull, livid, brown, or violet colour, or mottled, with thickening, and sometimes a diminution, but at other times an apparent increase of its consistency; more rarely it is quite pale, or presents a granular aspect, the vascularity, when present, being in general most conspicuous about the earlier divisions of the bronchi, but not unfrequently extending to the smallest tubes in one or both lungs. The heart, especially the right auricle, and the liver are often found remarkably

distended with blood, the latter organ being sometimes observed extending below the margins of the ribs before death; these several obstructions arising from bronchitis, occasionally giving rise to œdema of the lower limbs, ascites, and even to general dropsy. It is after a longer or shorter continuance of chronic bronchitis, too, that we so commonly find emphysema of the lungs and dilatation of the bronchial tubes, changes which modify not only the symptoms of the disease, but also the physical signs by which it is to be distinguished from other affections of the chest. The disease may also be found complicated with œdema of the lungs, pleurisy, pneumonia, phthisis, organic disease of the heart, and hydrothorax.

Diagnosis of Bronchitis.—The oppression or soreness within the chest, the wheezing, dyspnœa, cough, and expectoration, will in general readily declare the nature of the disease even to those who do not have recourse to auscultation and percussion; but when to these functional we add the physical signs furnished by the latter means, no doubt whatever can remain, beyond a suspicion of a complication. In bronchitis, percussion elicits a clear sound, and if there be much emphysema, as not unfrequently happens in the chronic form of the complaint, the chest is sometimes preternaturally resonant. Auscultation discovers to us, the mucous, sonorous, and sibilous rattles in various situations, proportions, and degrees, according to the extent of the bronchi affected, and according to the quantity and quality of the secretion and the degree of thickening of the membrane itself; whilst, as in catarrh, a highly distinctive sign is the absence of respiratory murmur in a part which continues nevertheless to be resonant on percussion.

From simple pneumonia, bronchitis is to be distin-

guished by the violence of the cough, by the quality and quantity of the matter expectorated, by the presence of the mucous, sibilous, and sonorous rattles, and by the absence of the crepitating rattle, bronchiphony, bronchial respiration, and dullness of sound on percussion. In the first stage of simple pneumonia, the heat of surface is generally pungent; in bronchitis it is milder; in simple pneumonia the cough and expectoration are slight or altogether wanting, and when present, the matter expectorated is scanty, remarkably viscid, and although sometimes colourless, most frequently of various shades of gamboge yellow, light green, rusty brown, or red. When the whole of the signs are taken into consideration, neither the crepitating rattle occasionally met with in bronchitis, nor the mucous rattle so often attendant on hepatization of the lung in pneumonia, can possibly lead to mistake.

From simple pleurisy, it is readily distinguished by the character and frequency of the cough, by the expectoration, by the several rattles, and by the absence of the stitch in the side, egophony, bronchophony, and dullness of sound on percussion.

A very large majority of the cases formerly regarded as hydrothorax, are now justly suspected to have been merely severe forms of chronic bronchitis; whilst all difficulty of distinguishing the two diseases has been removed since the introduction of the stethoscope. Indeed, hydrothorax when it does occur, is in most instances a mere effect of some other disease, which may for the most part be easily recognised. It does, however, now and then happen, that considerable serous effusion takes place into the cavity of the chest without any very obvious organic or functional disease, beyond some slight evidences of an inflammatory state of the pleura. Such effusions, when inconsider-

able, occasion merely oppression of the breath, especially felt on making exertion, and are to be distinguished from bronchitis rather by the absence of the ordinary functional and physical signs of the latter disease, than by any positive symptoms peculiar to it; for under such circumstances the fluid gravitates towards the diaphragm, egophony is rarely to be made out, and we fail to detect the effusion. When, however, the effusion is such as to occupy a large portion of the chest, we have dullness of sound on percussion, absence of respiratory murmur, distinct or indistinct bronchophony, great distress of breathing, especially in the recumbent position, sudden starting from sleep in a fright, and swelling of the lower limbs.

In mere œdema of the lungs, we have little or no cough or expectoration, but there is considerable dyspnœa, and we detect the crepitating rattle.

There is no difficulty in distinguishing bronchitis from disease of the heart and large vessels, unless they both happen to be present at the same time. Such complications are by no means unfrequent, and are to be recognised by a careful investigation into the functional and physical signs of each.

The spasmodic forms of chronic bronchitis and what has been called dry catarrh are to be distinguished from asthma by auscultation detecting more or less permanent signs of obstruction in the bronchial tubes, and occasionally by the expectoration which now and then arises from or succeeds to each paroxysm of dyspnœa.

Causes of Bronchitis.—Bronchitis is one of the most frequent and most fatal diseases of this climate. It is most prevalent as well as most severe in winter, but may occur at any period of the year. Neither age nor consti-

tution is proof against it; it is one of the most frequent and dangerous diseases of infancy; the adult and middle periods of life are also very obnoxious to it; and it constitutes one of the most common infirmities of old age, often becoming habitual, and at last proving fatal. Some people are naturally more prone to bronchitis than others, depending either upon peculiar idiosyncrasy or merely on an irritable and plethoric habit of body; but in the majority of cases, the first attack of the disease can be distinctly traced to some accidental exposure to the exciting cause; and after one attack, we know that it is very readily reproduced.

By far the most common exciting cause of the disease in adults, is general or partial exposure to cold, especially when combined with damp or moisture. It also prevails epidemically as one of the forms of influenza. In infants and children, the disease may be produced by the same causes; but in the former, it is much more frequently occasioned by the irritation of dentition. Bronchitis even of an active character, may be excited by certain gases, or other irritating matters, inhaled into the bronchi; and it is by no means uncommon to have the chronic form of the disease induced in artificers whose occupation exposes them to dust or to the minute particles of various matters which float in the air of their workshops. We observe this in knife-grinders, glass-cutters, and grindstone-makers, who often become the subjects of the dry and spasmodic forms of chronic bronchitis. A greater or less degree of bronchitis, pretty generally accompanies pneumonia and phthisis pulmonalis; and it is a very frequent complication in continued fever, measles, whooping-cough, ague, and diseases of the heart.

Prognosis.—The prognosis in acute bronchitis, is to be

drawn from a consideration of the age and constitution of the patient, the extent and severity of the inflammation, and from its being a first attack or the repetition of a disease frequently experienced before. When the patient is young and of good constitution, and when it is a first attack, the prognosis is upon the whole favourable, although the inflammation may affect a considerable portion of one or even both lungs, provided early application be made for assistance. When, however, the inflammation is very intense and occupies the greater part of both lungs, it is at all times a most dangerous disease even in young persons of good constitution, and often proves fatal in spite of our earliest and best exertions. When the acute form of the disease attacks old people, the intemperate, persons of bad constitution or of cachectic habit of body, or when it assails those already labouring under organic disease, especially of the heart, the prospect of recovery is at all times greatly lessened, but still more so, if an acute attack happen to supervene upon a long-continued chronic form of the disorder; such cases, in every constitution, being out of all proportion, the most frequently fatal. With very few exceptions, bronchitis, whether acute or chronic, is greatly aggravated by the intense colds, and damps of winter; so much so, that we always find great numbers cut off by the complaint during that period of each succeeding year. Our prognosis therefore ought at that time to be always extremely guarded, not only for the reasons stated, but because ordinary remedies have then comparatively little influence in controlling the disease.

As it regards an individual case; when in a first attack of acute bronchitis, the matter expectorated presents the successive changes described as passing from thin to viscid, and from viscid to thick yellow or green and

bland, it will in general be found that all the symptoms undergo a corresponding improvement, and gradually cease altogether. But, as in practice, we meet with every possible variety in the appearance, quantity, quality, and successive changes of the expectoration, a favourable prognosis, as well in acute as in chronic bronchitis, ought rather to have reference to the facility of expectorating, the ease and freedom of breathing, and the natural aspect of the patient's countenance. When the secretion is copious and the expectoration difficult, when the breathing is quick and much obstructed, when the pulse is frequent and perhaps large and labouring or throbbing, but nevertheless soft and compressible, when the face is of a dingy paleness and the lips livid, or when the whole countenance assumes a purple hue, the danger is at all times considerable; and when the bronchial secretion ceases to be brought up, when it rattles in the tubes or throat, when the pulse gets small as well as feeble, when the breathing becomes laborious, drawing in the integuments above the clavicles at each inspiration, and when stupor or asphyxia supervenes, especially if the latter be accompanied by that modification of breathing in which the inspirations are made at long intervals and with a sort of gasp, the case is all but hopeless.

After one attack, the probability of a recurrence will depend very much upon the precautions taken by the patient to avoid the exciting causes; and, after repeated attacks the same may be said respecting the probability of a complete recovery. Such complete recovery, however, is much more to be expected in the young and otherwise healthy, than in the aged and infirm; and indeed in the latter, especially those of a leucophlegmatic temperament or gouty habit, it is hardly to be hoped for, and we must

be content to relieve existing symptoms and endeavour to ward off an acute attack.

Treatment.—As there is perhaps no disease, the treatment of which requires greater caution and circumspection than bronchitis, it would be well for the student to fix firmly in his mind, the principles upon which it ought to be conducted. It is true that the disease in all its forms is one of inflammation, and that the activity of the treatment must be to a certain extent regulated by its intensity. It must, however, be borne in mind that it is inflammation of a mucous membrane, over which depleting measures exert a very partial control; that in spite of every remedy such inflammation will generally continue an indefinite length of time although in a subdued degree; that the inflammation as long as it lasts, is attended with a morbid secretion which obstructs the bronchi and seriously interferes with the functions of the lungs; and that in order to free the bronchial tubes from the excessive secretion, the patient has to pass through a longer or shorter period of great exertion, distress, and want of repose. From this it follows, that all remedies calculated greatly to impair the patient's strength, should be employed with the greatest reserve, and that even in the most acute attacks, the period of active depletion is likely to be of very short duration.

The indications are precisely the same as those laid down in catarrh, the objects of treatment being in every instance to subdue febrile and inflammatory action, to facilitate expectoration, and allay irritation.

When the patient is young and robust or plethoric, when it is a first attack, and when the local oppression and general excitement are considerable, blood may be taken from the arm to the extent of from twelve to six-

teen or even twenty ounces, and may probably be repeated to a somewhat less extent on the following day; after which, it will seldom be necessary or proper to carry it further. When there exists a doubt concerning general blood-letting, it may be of use to employ cupping or leeching. The question of depletion being disposed of, it is a very good practice in such severe original attacks, to administer mercury in combination with anodynes and diaphoretics. A grain or two of calomel with a grain of opium and quarter of a grain of tartar emetic; or the same quantity of calomel with one of ipecacuanha and three or four grains of Dover's powder every six hours, will often answer very well, giving at the same time the liquor ammon. acet. mixture, with or without twenty minims of antimonial or ipecacuanha wine, if the stomach will tolerate or the strength will bear it. The bowels should be kept open by the occasional use of senna and salts, the patient put upon slops, confined to his bed, and the apartment maintained at a steady and moderately warm temperature. Under this plan of treatment patients will commonly proceed favourably, and very generally manifest a decided improvement, upon the mercurial action being induced.

When the disease is less severe, local depletion, or at most one moderate general bleeding, will be sufficient, together with mild mercurials and the diaphoretic and anodyne medicines already mentioned. In still less severe cases four grains of the extract of hyoscyamus or of conium, with a grain of ipecacuanha, and a very mild mercurial, may be substituted; whilst at a rather more advanced period, a blister to the sternum will sometimes afford considerable relief.

Both in the severe and milder forms of acute bronchitis, some recommend the oily and mucilaginous mixtures, but

upon the whole, the saline diaphoretics are perhaps preferable.

When acute supervenes upon chronic bronchitis, it constitutes one of the most difficult cases we are called upon to treat, and especially when it occurs in persons who are old, infirm, or of bad habit of body. When the person is young, one moderate bleeding of ten or twelve ounces may probably be had recourse to, but it must be done with great caution; and if there be the least doubt of its propriety, cupping or leeching should be substituted. In such cases a blister is often of great service. After the necessary depletion, one of the less active combinations of ipecacuanha anodynes and mercury just mentioned, may be given, together with the diaphoretic mixture. At a later period of such an attack, or when the disorder is of the chronic kind from the first, the almond, or oily, or mucilaginous mixture may be given with the vin. ipecac., exhibiting at the same time as an anodyne, the extr. papav., extr. conii, or extr. hyoscyami.

Ipecacuanha is unquestionably by far the most powerful and safe of all reputed expectorants; nevertheless, in many chronic and obstinate cases, and especially when the secretion is copious and expectoration difficult, the mineral acids have sometimes proved highly beneficial. When with copious secretion, there are indications of want of power, the mineral acids with decoct. senegæ or infus. serpentar.—either of the two latter with liq. ammon. acet.; and also the more stimulating expectorants, such as the tincture or oxymel of squills, the ammoniacum, myrrh, the foetid gums and the balsams, with or without some of the stronger preparations of opium, have all, in different instances been found of use. In some of the chronic forms of bronchitis, especially that called dry catarrh, and

which more or less resembles asthma, the potassæ carbonas sometimes proves serviceable. Many other combinations of medicines have been recommended and given with advantage in bronchitis, particularly in its milder forms; of these may be mentioned oxymel mixture with nitre and syrup of poppies, or hydrochlorate of morphia; the compound infusion of roses and compound tincture of camphor; and various modifications of opiate linctus.

In every case of bronchitis, the patient's strength must be duly supported by a proper allowance of bland nourishing diet, such as arrowroot and chicken or mutton broth, even in the more acute cases; but at an earlier period, and with greater freedom, in the chronic form of the disorder, and when an acute attack supervenes upon the latter. When the debility is very great and the patient has scarcely power to expectorate, wine and water or white wine whey, or egg and wine, together with ammonia, either alone or with the decoction of seneka or infusion of serpentary, must be had recourse to. When the more powerful stimulants, æther and ardent spirits, become necessary, the patient will rarely recover.

In almost every form of bronchitis, emetics have been strongly recommended by some practitioners, and undoubtedly they often prove of excellent service, especially when given early, and in the bronchitis of infants. In such young subjects, the ipecacuanha is the mildest and safest, a few grains of the powder being merely diffused through some simple watery vehicle. In adults, the ipecacuanha and antimony in combination may be employed. Some have recommended a combination of the vin. ipecac. and acet. scillæ, others the sulphate of zinc, for the purpose.

When the disease occurs in infants, leeching is almost

the only form of depletion they will admit of, and even that, is not often required. The repeated application of a mustard poultice to the chest, may be substituted for a blister, and the patient may have a warm bath from time to time. Perhaps one of the best forms of internal medicine, is from a quarter of a grain to a grain of calomel, with an equal quantity of pulv. ipecac. two or three times a day; and a diaphoretic mixture, or almond emulsion, containing a mild anodyne, such as a quarter of a grain or a little more of the extr. conii or extr. hyoscyami, or a few minims of tinct. hyoscyami.

As the irritation of dentition is by far the most frequent cause of bronchitis in infants, the state of the gums should never be overlooked nor neglected.

Too much importance cannot be attached to the maintenance of a moderately warm and steady temperature of the patient's apartment in every case of bronchitis, acute or chronic; whilst, in order to prevent a return after one attack, the patient should be recommended to wear flannel next his skin, and worsted stockings, and to avoid cold and vicissitudes. We may at the same time, endeavour by means of gentle vegetable and mineral tonics and proper diet and regimen, to improve the general health, and thereby render the individual less liable to be affected by the ordinary exciting causes. In very obstinate cases, the patient may be recommended to try the effect of a voyage to, or a residence in, a warmer climate.

ACUTE LARYNGITIS.

The symptoms of this disease, which is almost confined to adult life, vary much in different cases: there is commonly uneasiness, soreness, or pain in the larynx, increased by forcible external pressure, with hoarseness,

feebleness, or total extinction of the voice, a harsh, hoarse, or ringing cough, with slight expectoration of mucous, bloody, or puriform sputa; sometimes, however, there is neither cough nor expectoration; there is generally great difficulty of breathing, especially in the act of inspiring, which is attended with a peculiar hissing noise, as if the air met with considerable impediment from the closure of the glottis; this difficulty of breathing is apt to become suddenly aggravated at longer or shorter intervals, the agony and sense of suffocation during each aggravation being such as greatly to alarm both the patient and the attendants; the face is usually pale, or when the distress in breathing is very great, it is of a livid hue, and the lips are purple; there is not unfrequently some degree of pain felt in swallowing, and on making an inspection we occasionally discover redness about the fauces, and more rarely redness and tumefaction of the epiglottis; in the latter case, the epiglottis ceases to act as a perfect valve, so that attempts to swallow now and then threaten suffocation. These local symptoms prevail in different degrees and proportions in different instances, and are for the most part either preceded, accompanied, or followed by the ordinary signs of inflammatory fever—chilliness or rigors, succeeded by a hot skin, a white tongue, thirst, and a frequent and strong or a frequent and feeble or oppressed pulse.

On *dissection* after death in fatal cases, we find the lining membrane of the larynx red, thickened, softened, besmeared with a tenacious or puriform mucus, and occasionally ulcerated; the epiglottis is also now and then found thickened and erect; but one of the most constant appearances is an infiltration of serous or puriform fluid in the submucous cellular tissue within the larynx;

it is this infiltration which proves the chief cause of the obstructed respiration, most observable during inspiration; whilst the frequent and sudden aggravations, as well as the immediate cause of death in many instances, are manifestly the result of spasm affecting the muscles of the glottis.

Chronic Laryngitis.

Chronic laryngitis is much more frequently met with than the highly acute form of the complaint, and like it, is characterized by soreness or actual pain in the larynx; hoarseness, feebleness, or abolition of the voice; difficulty of breathing, with wheezing or hissing, and occasionally a harsh *râle sonore*, especially during inspiration; a croupy or hollow cough, with expectoration of a purulent or bloody matter; emaciation; and symptoms of hectic fever: both the general and local symptoms, however, are much less urgent than in acute laryngitis, although probably attended with equal danger as it regards the ultimate result.

After death, the mucous membrane of the larynx, and sometimes that of the epiglottis, are found more or less extensively ulcerated and destroyed, the ulcerations occasionally not amounting to more perhaps than a few irregular patches of abrasion: in other cases, however, we find innumerable minute ulcers scattered over the internal larynx, whilst in some old cases, there is scarcely a vestige of mucous membrane or of epiglottis left, the indurated submucous tissue being merely covered by an unhealthy-looking puriform matter. In chronic laryngitis, the submucous infiltration is neither so considerable nor so uniformly present as in the acute form of the complaint.

Diagnosis.—The symptoms of laryngitis are so characteristic and striking, that there will seldom be any difficulty in recognising the disease. The loss of voice incident to hysterical females, can hardly be mistaken. In *raucedo*, or common hoarseness, although there is loss of voice and occasionally some cough and soreness about the throat, and although it is not improbable that these symptoms may likewise depend in every case upon an inflammatory condition of the mucous membrane of the larynx, we nevertheless know, that so long as there is neither mechanical nor spasmodic interruption to the breathing, a common hoarseness is not, like laryngitis, attended with the least danger, and requires no very active treatment. Many of the symptoms of idiopathic laryngitis, are now and then produced by a sudden and severe attack of measles; by tumors and abscesses situated externally to the larynx; by polypus within the larynx; by irritation of the recurrent nerve, arising from aneurism of the aorta or of the arteria innominata; and in children, by the irritation of dentition; all of which sources of fallacy ought to be carefully investigated.

Causes.—The most frequent cause of acute laryngitis, is cold, applied either to the body generally or to the neck and throat in particular, and especially when accompanied by damp or moisture, or when communicated through the medium of a current or draught of air. It may be induced by mechanical violence; by the accidental entrance into the larynx of substances which irritate by their bulk, by their asperity, or by their temperature; it may arise from the inflammation of the tonsils extending to the larynx; or it may supervene upon scarlet fever, measles, or small-pox.

Chronic laryngitis may be a mere sequel of the acute

form; more commonly, however, it is original, and is met with principally in persons of bad or broken-down constitutions, and in those who have had occasion to take mercury largely for venereal complaints, or who have their laryngeal cartilages in a state of ossification. It is in cachectic constitutions, too, and in persons of a leucophlegmatic and exsanguine aspect, that very slight attacks of inflammation about the throat, are often sufficient to induce œdema of the glottis, and consequent suffocation of the patient. Chronic laryngitis is a very frequent complication of phthisis pulmonalis.

Prognosis.—Acute laryngitis is at all times a disease of great danger; the tumefaction of the mucous membrane, and the infiltration of the cellular tissue beneath it, in the immediate vicinity of the glottis, so speedily and so seriously interrupt the respiration, that the disease cannot fail in every instance, to create the liveliest apprehensions for the patient's safety. If he be not advanced in years, if he be of good constitution, and if remedies are early and energetically applied, there is reason to hope that success may attend our efforts; but if he be old and of a feeble, cachectic, leucophlegmatic, or exsanguine habit of body; or should there be any considerable delay in employing proper means to subdue inflammation, it but too often happens, that the powers of life sink under the combined influence of exhaustion and suffocation.

In chronic laryngitis, the prognosis is scarcely less unfavourable as it regards ultimate and complete recovery; the prospect of success nevertheless will necessarily vary with the nature of the predisposing and exciting cause. When it is merely a sequel of the acute form, we may hope by a judicious use of remedies to cure the patient; but when it is original and takes place in bad and broken-

down constitutions, or when it is connected with a previous abuse of mercury or with ossification of the cartilages, little more than temporary relief is in general to be expected; and when it is a mere complication of phthisis pulmonalis it is, of course, altogether hopeless.

Treatment.—To be successful, the treatment of acute laryngitis must be prompt and active. As the disease is one of inflammation accompanied by a remarkable tendency to spasm about the glottis, our object should be, to subdue the inflammation by antiphlogistic measures; and allay or prevent the spasm by the simultaneous employment of anodynes, and by the local application of warmth and moisture. If there be any considerable febrile disturbance, the necessity of general blood-letting is sufficiently apparent; and even if not, should the local affection prove severe, and provided the patient be of good constitution, it ought never to be neglected in the first instance. The patient may be bled to such an extent as to induce a tendency to syncope; immediately after which, two or three grains of calomel, with a grain of opium and a quarter of a grain of tartar emetic, may be given, and repeated every three or four hours, till the constitution becomes affected by it. After general bleeding, six, eight, ten, or twenty leeches, according to the age of the patient and particular circumstances of the case, may be applied to the external throat, followed either by a large warm poultice, or assiduous sponging with very hot water. At a more advanced period, a blister may be applied, and afterwards kept open by means of savine cerate. Of course, the strictly antiphlogistic regimen must be observed; and in order to prevent irritation of the glottis, and thereby mitigate the spasm sometimes so painfully felt during inspiration, the patient's apartment ought to be

maintained at a moderately warm and steady temperature. By perseverance in these general and local remedies, occasionally aided by additional diaphoretics and the warm bath, the symptoms will often be found to give way, a well-marked amendment being often distinctly observable as soon as the system is brought fully under the influence of mercury. When the acute stage of the disorder is past, the patient may employ, night and morning, external friction with some anodyne or stimulating embrocation, and wear a piece of flannel round his throat for some time afterwards.

When the obstruction to the breathing is such as to threaten suffocation, it has been proposed to perform the operation of tracheotomy; but although such an operation in some instances becomes absolutely indispensable, and affords the only chance of saving the patient, it must be confessed that it has rarely been followed by success.

In chronic laryngitis, the treatment will no doubt require to be modified somewhat, according to the nature of the predisposing and exciting causes; nevertheless the same objects are to be kept in view as in the acute form of the complaint. General bleeding will seldom be required, our chief reliance being placed on the more or less frequent application of leeches, fomentations, poultices, blisters and liniments; with the internal administration of anodynes; and occasionally, small alterative doses of some mild mercurial. Four grains of *extr. conii* or *extr. hyoscy.*, with a grain of *pil. hyd.* night and morning, or four grains of Plummer's pill with four or five of Dover's powder every night, will sometimes answer the purpose very well, giving however, at the same time some demulcent anodyne mixture or linctus to assist in allaying irritation about the glottis. It is of so much importance

to mitigate the cough, that in many instances the stronger preparations of opium may be employed with the greatest advantage, either alone or in combination with diaphoretics.

It is in the chronic forms of laryngitis, that attention to the patient's general health constitutes a most influential part of the treatment. The powers of the constitution are generally impaired, and we must endeavour to improve them by such tonic medicines, as cinchona or sarsaparilla with mineral acids, by the iodide of potassium, by small doses of Fowler's solution, the warm bath, and good nourishing diet, and country air.

When œdema of the glottis threatens, whether from recent and acute, or from chronic and slight inflammation, a mustard poultice has occasionally afforded, at least, partial relief.

CROUP.

The Cynanche Trachealis of Cullen.

This disease, with few exceptions, makes its attack between the periods of weaning and puberty, but perhaps most frequently of all from the age of three to ten years. It very commonly presents more or less of the character of a common catarrh at its commencement, being, like catarrh, also preceded or accompanied by the ordinary signs of febrile excitement. In the course, however, of one, two, or at most three days, the disorder develops itself, and displays its characteristic symptoms. The little patient is affected with a cough, which is attended with a very peculiar harsh, husky, or crowing sound, but with little or no expectoration; the respiration is greatly obstructed, the breathing being quick, and each

inspiration accompanied by a hissing and sometimes by a rough grating noise ; the voice is harsh, as if the individual spoke through a brass tube, or it is husky and does not amount to more than a whisper : from the obstructed breathing, the face is flushed, or both face and lips present a livid paleness ; there is now and then a slight degree of redness and swelling observable in the internal throat, and occasionally tenderness about the neck, with slight pain in swallowing. The most remarkable, constant, and characteristic symptoms are unquestionably, the husky, hoarse, or brassy voice ; the shrill or ringing cough ; and the obstruction to the breathing, which is liable to great and sudden aggravations, and is at all times most urgent during inspiration.

In bad cases, these symptoms go on increasing till the difficulty of breathing amounts to a most distressing sense of suffocation, which is perhaps for a time somewhat relieved by the expectoration either of a quantity of mucous or muco-purulent matter, or of a few shreds of a membranous-looking mass detached from the larynx, trachea, or bronchial tubes. In this way, the case may proceed for one, two, three, or more days, with various degrees of severity, until the patient sinks completely exhausted, either by the mere permanency of the dyspnœa, or by the violent paroxysms which are so apt to supervene during the whole continuance of the disorder. In other instances, the patient expires suddenly, being actually strangled, either from spasm affecting the muscles of the glottis, or in consequence of a detached portion of false membrane being forced into and blocking up that aperture ; or the functions of the lungs are at length so interrupted, and the congestion of the brain is such, that asphyxia or convulsions close the scene.

The disease consists essentially in inflammation affecting the mucous membrane of the larynx, trachea, or bronchial tubes; these several parts being involved in variable proportions in different cases. It is a disease, nevertheless, which in its progress, leads to results very different from those of ordinary inflammation of a mucous membrane, results probably depending less upon the degree than upon the kind of inflammation. Instead of the usual modifications of mucous secretion, an albuminous matter is thrown out, which forms a more or less perfect adventitious membrane overspreading the inflamed surface. This false membrane proves a mechanical cause of obstruction to the respiration; it sometimes gradually encroaches on the aperture of the glottis till it suffocates the patient; or, its lower portion becoming detached by the violence of coughing, it is forced into the glottis, acts like a plug, and so destroys life.

On *dissection*, we find the albuminous matter deposited on the parts that had been inflamed, either in separate and irregular flakes, or in the form of a more or less uniform membrane, of various degrees of thickness and consistency, and of a whitish, yellowish, or greyish colour. This membrane sometimes appears to be made up of several layers; it is usually softer and more loosely adherent below than above; in the trachea and bronchi it usually takes on the tubular forms of these parts, and its free surface is very commonly found covered with a thickish mucous or muco-purulent fluid.

Diagnosis.—Croup appears to be the inflammatory laryngeal affection of infancy and childhood, as ordinary laryngitis is that of adults; and although common laryngitis may unquestionably occur in the former, and thereby give rise to symptoms closely resembling those of croup,

any difficulty of diagnosis will be of comparatively little consequence, since the treatment of the two diseases is much the same. In early infancy, we occasionally observe considerable obstruction about the throat, producing somewhat of a croupy sound both in inspiration and expiration, but especially during the former, and without any difficulty of swallowing. It appears to depend entirely upon a want of muscular power about the velum; it lasts for a variable period, and cannot very readily be mistaken for croup. When in an acute attack of common catarrh, the inflammation is most actively developed in the mucous membrane of the larynx and trachea, or for a time happens to be limited to these parts, we occasionally have considerable difficulty of breathing, and a harshness or hoarseness of the cough and voice, which bear some resemblance to croup. A consideration, however, of the age of the patient, the progress of the case, and the development of fresh and less equivocal symptoms, will, in general, enable us to decide in the very few instances in which such a doubt can arise. A sudden and severe attack of the eruptive fever of measles, has been mistaken for croup; but the watery eye, the sneezing, and the discharge from the nose usually observed in measles, together with the history of the case, will for the most part sufficiently point out the distinction.

Symptoms of croup may be induced by foreign bodies accidentally introduced into the larynx, or by tumours or abscesses pressing upon that organ; whilst symptoms somewhat resembling those of spasmodic croup are not unfrequently produced by dentition, and often precede, alternate with, or even form a part of general convulsions.

Prognosis.—Croup is a most dangerous disease, and

the prognosis ought perhaps in most instances to be unfavourable, or at least extremely guarded; for however slight the attack, and however flattering the appearances, it must be remembered that a spasm of the glottis, or a portion of detached false membrane forced into that opening, may suddenly and unexpectedly destroy life, at any period of the complaint. If the attack be of moderate severity, if the child be naturally of good constitution, and assistance be sought early, our chance of success will be proportionably great. When the febrile state abates, when an universal moisture bedews the surface, when the effort during inspiration becomes less marked, and when the patient succeeds in expectorating a portion of false membrane, with manifest relief to the respiration, we have reason to hope that a favourable change is taking place; but if, on the contrary, the effort during inspiration and the sense of suffocation and consequent jactitation become aggravated, if the face assume a livid paleness, if the head be thrown back, if the eyes stare, if the voice be entirely lost, if the attempts to cough do not amount to more than a forcible husky expiration, there will be but too great reason to apprehend, that the powers of life must shortly give way, and the patient perish.

Causes.—Although some have been inclined to consider florid and irritable children most liable to croup, it must be acknowledged that very little has hitherto been positively ascertained respecting the causes which predispose to the complaint; and if we do occasionally observe several members of a family affected at the same time or in succession, it is probably attributable, rather to all of them being placed under the same circumstances in regard to locality, than to an hereditary tendency. The most common exciting cause, appears to be cold and damp; and

hence the greater prevalence of the disease in low than in elevated situations. There is little reason to suppose that it ever proves contagious, although it now and then appears to prevail as an epidemic.

Treatment.—The two principal objects in the treatment of this disorder are, to subdue the inflammation and to allay irritation. As there is some reason for believing that the peculiar inflammatory product which proves so great a source of danger, results from the kind, rather than from the mere intensity of the inflammation, we ought, in regard to depletion, to be guided more by the degree of febrile excitement present and by the age and constitutional powers of the patient, than by the mere obstruction to the breathing. Accordingly, if the febrile symptoms are acute, and if the child be of good constitution, blood may in the first instance be taken from the arm, to the amount of from four to eight or ten ounces, according to the age and the effect produced. If there be any doubt about the propriety of general depletion, from two or three to eight or ten leeches may be applied to the external throat, their application being followed by a poultice, or by sponging with very hot water or decoction of poppy-heads. Immediately after the depletion, an emetic may be given, either of ipecacuanha or, what is more powerful, of the tartar emetic. As soon as the vomiting has ceased, calomel should be freely administered,—two, three, or four grains, with a grain of ipecacuanha, and one, two, or three of extr. of conium or of extr. of hyoscyamus, every four or five hours; or, the calomel may be given with the ipecacuanha in powder, whilst the anodyne is added to a diaphoretic mixture of liq. ammon. acetatis, with which we may join ten or fifteen minims of antimonial wine. By these means, and by the warm bath, we must endeavour

to subdue the inflammation and prevent the occurrence of spasm of the glottis; the emetic being repeated from time to time as circumstances shall indicate. In proportion to the greater age of the patient, will be the propriety and expediency of substituting Dover's powder and the stronger preparations of opium, for the milder anodynes mentioned. The patient should be confined to bed, and his apartment maintained at a moderately warm and steady temperature; he must live upon slops, be kept as quiet as possible, and if sufficiently intelligent be requested to abstain from talking. At a more advanced period of the disorder, it may be advantageous to administer the reputed expectorants with anodynes, and to support the powers of life by ammonia and by a more liberal allowance of nourishment. Should the patient be threatened with suffocation, we have no alternative but to recommend the operation of tracheotomy, however small may be the chance of thereby saving the patient's life.

Spasmodic Croup.

Some children who have experienced an attack of ordinary croup in early life, continue perhaps for years afterwards, liable to have croupy symptoms reproduced whenever they become the subjects of the slightest catarrh. In other instances, children are every now and then seized with croupy cough and great difficulty of respiration, but unaccompanied by any febrile excitement or symptoms of local inflammation. From the latter circumstance, and from the attacks coming on suddenly and as suddenly disappearing, the affection has been regarded as spasmodic rather than inflammatory, and has accordingly received the name of Spasmodic Croup. It is probable, however, that in every instance, there is more or

less of an inflammatory state, although it is equally probable, that from a morbid susceptibility of the parts about the glottis, an extremely slight degree of inflammatory action may prove sufficient to excite spasm, and thereby produce the alarming symptoms. In such cases the treatment should be gentle. A mustard poultice may be applied to the throat, or the patient immersed in a warm bath. A purgative medicine, by the mouth or by glister, should be administered, and afterwards some saline mixture containing an anodyne of extr. conii or extr. hyoscyami; or, according to the age of the patient, the stronger preparations of opium. In the more severe cases, an emetic may be given at the commencement, followed by the warm bath, local fomentations, moderate doses of calomel, and an anodyne diaphoretic mixture. After an attack of spasmodic croup, the general health should be improved, and the irritability of the system at large, and of the glottis in particular, diminished by great attention to the state of the bowels, by the use of mild vegetable or mineral tonics, by good nourishing diet, country air, the cold bath, and by the employment of stimulating and anodyne embrocations,—flannel being at the same time constantly worn round the throat.

HOOPING-COUGH, OR WHOOPING-COUGH.

The Tussis Convulsiva of many authors, the Pertussis of Dr. Cullen, and commonly known by the name of Kink-cough or Chin-cough.

The whooping-cough appears to consist in a specific inflammation of the air passages, incident to infants and children, rarely attacking adults, usually occurring but once

during life, frequently epidemic, and manifestly contagious. It usually commences with the ordinary symptoms of catarrh, together with some degree of redness and weeping of the eyes, and slight turgidity of the face. At length, perhaps in about a week, the true character of the disease becomes developed. The cough comes on in paroxysms, which are at an early period frequent and severe; this cough is very peculiar, and consists of many short, convulsive, and rapid expirations, followed by one loud or crowing and long-drawn inspiration; and this succession repeated an uncertain number of times, makes up an individual paroxysm of the complaint. During the paroxysm, the patient experiences a distressing sense of anxiety from the interruption to respiration; indeed it is only necessary to hear the protracted expiration during the continuance of the rapid convulsive cough, to feel conscious that the patient is suffering all the horrors of threatening suffocation; and if we look at him, we observe his face swollen and livid, the jugular veins turgid, and the eyes starting and suffused with tears. The feelings of the patient are somewhat relieved by the long and noisy inspiration that follows, but the cough is repeated with the same effect for an indefinite number of times. At length, he succeeds in expectorating a quantity of white or transparent viscid stringy phlegm; upon which the paroxysm ceases; or, what is extremely common, it ceases on his rejecting the contents of his stomach.

When the paroxysm is over, the patient in every instance, feels languid and depressed, with some hurry of breathing; and if a child, it usually cries in a feeble and plaintive manner. In ordinary cases, however, no pain is felt, and during the intervals of the paroxysms the patient makes little or no complaint; on the contrary, he returns

to his play or to his usual habits, as if nothing were the matter; and if vomiting terminated the fit, often craves for food and eats with avidity. Such are the phenomena which commonly present themselves during a paroxysm of hooping-cough. These paroxysms are repeated at uncertain intervals during the day and night, the patient not unfrequently having in the daytime sufficient warning of their approach, to induce him to seize hold of some fixed object by which to support himself during the agitation of coughing. They are at first probably attended with little or no expectoration, and are then for the most part both frequent and severe; in a short time, however, the secretion is more copious, with evident relief; the paroxysms now gradually get less and less frequent; the expectorated matter becomes thicker, it is more easily expelled, and at length, perhaps after the lapse of two or three months, the disease disappears altogether. Nevertheless, in many cases, the peculiar cough continues for a much longer period, either from mere habit, or more probably from morbid sensibility of the structures originally affected. In other instances, although every symptom of the disease may have entirely disappeared for a time, the hoop is apt to be reproduced in a slight degree, on the supervention of cough from common causes.

In a large majority of cases of hooping-cough, the febrile excitement is very inconsiderable; and if it do exist, it is only at an early period of the disorder, and soon vanishes: neither is there any material dyspnœa or other pulmonary oppression, beyond what temporarily results from an individual paroxysm. This, however, usually disappears with the paroxysm, though sometimes not before it has occasioned such turgescence of the head and face, as to lead to epistaxis, or in some rare instances even to hæmorrhage

from the eyes and ears. But in the more aggravated forms of hooping-cough, we often observe at any early period, considerable symptomatic fever, great dyspnœa, lividity of the lips, and perhaps pain in the side; in short, symptoms of severe bronchitis, of pneumonia, or of pleurisy, super-added to the specific disorder. In other cases, and especially in scrofulous and hydrocephalic-looking children, the turgescence of the head leads to hydrocephalus, or to convulsions and sudden death.

On *dissection* the appearances vary according to the immediate cause and mode of death. If the patient die early in consequence of intense thoracic inflammation, we most frequently discover hepatisation of the lung, either in separate and distant lobules, or extending over a considerable and continuous portion of one or both lungs. With these appearances, we occasionally find indications of acute bronchitis or pleurisy, or both. If, however, the patient be cut off early by a sudden affection of the brain, and without any evidence of severe thoracic inflammation, we seldom find more than patches of redness and thickening of the bronchial membrane, together with a greater or less quantity of viscid white mucus, chiefly in the smaller bronchi; whilst in the brain itself, we discover either no very obvious change whatever, or, what is more common, great congestion, with serous, or more rarely purulent effusion beneath the arachnoid; or serous effusion into the ventricles. Whenever the disease has lasted for some time, but especially when it gives rise to severe and protracted bronchitis, we almost uniformly have pulmonary emphysema, and occasionally dilatation of the bronchial tubes, in addition to the appearances already described.

Diagnosis.—The symptoms of hooping-cough are so peculiar and characteristic, that there can seldom exist a

doubt respecting the nature of the disease, especially when it occurs, as it usually does, at an early period of life; nevertheless, it ought to be carefully borne in mind, that more or less of a convulsive cough, with a loud and long-drawn inspiration, may, both in children and adults, accompany any morbid condition which has the effect of exciting spasm about the glottis; whether that morbid condition be inflammatory, or result from foreign substances accidentally introduced into the larynx, from tumours or abscesses in its immediate neighbourhood, from dentition, or from irritation of the recurrent nerve of the par vagum. In ordinary cases, percussion detects no deviation from the normal state, but by auscultation we generally recognise the sibilant, sonorous, and mucous rattles in variable proportions, these indications of bronchial obstruction being in the majority of instances, most obvious at the posterior and inferior part of the chest. When the bronchial complication is considerable, or when pleurisy or pneumonia is superadded to the original complaint, their presence will be sufficiently revealed by the usual stethoscopic or physical signs.

Causes.—From the spasmodic character of the disease, especially as observed in its more advanced stage, some have supposed it to consist primarily of an affection either of the brain itself, or of the respiratory nerves in particular. In the present state of our knowledge, however, it is perhaps more safe as well as more practical, to regard the disease as consisting in a specific inflammation of the air-passages, associated with a strong tendency to spasm in the respiratory organs generally, but especially in the glottis.

There manifestly exists in the whole of mankind a susceptibility of the disorder, with the nature of which

we are altogether unacquainted, but which we know to be strongest in infancy and childhood, becoming less as the individual advances in years. Hence, although hooping-cough may attack an infant a few weeks after birth, and although adults and even aged persons are occasionally the subjects of it, the usual period of its occurrence is from three to six or eight years of age.

We are not aware of any *exciting* cause of the disorder, except it be contagion, concerning the existence of which, however, some have entertained a doubt. It sometimes appears to prevail epidemically. When the disease is once produced, very slight causes are in general sufficient to bring on a paroxysm of the cough, such as an overloaded stomach, indigestible food, exertion, smoke or dust, fits of anger, crying, or laughing.

Prognosis.—The prognosis generally is favourable, and indeed the majority of cases of hooping-cough are so slight as scarcely to require the least professional interference. The prognosis nevertheless must be regulated by a due consideration of the severity of the attack, the constitution of the patient, and the indications of inflammation within the chest and of congestion in the brain. When the febrile symptoms are acute at the commencement or in the early progress of the disorder, when the hurry of respiration, the lividity of the lips, and the physical signs prove the existence of severe pneumonic or bronchial inflammation, and when the brain is greatly oppressed, as indicated by drowsiness, stupor, or convulsions; danger is always to be apprehended: the relative degree of danger, however, being at all times most imminent when such symptoms present themselves in delicate, scrofulous, or rickety children. Though not immediately fatal, the disease occasionally so deranges

the general health as to lay the foundation of other disorders which ultimately destroy life. In some instances it terminates in an obstinate and long-protracted bronchitis, with copious muco-purulent expectoration, which either leads to hectic fever, extreme emaciation, and death; or continues with variable severity perhaps for years afterwards, and ultimately proves fatal from an aggravation of the complaint produced by some accidental exposure to the ordinary causes of catarrh. In other cases it appears to have the effect of inducing scrofula, disease of the mesenteric glands, or genuine tubercular phthisis.

Treatment.—As we are yet ignorant of the nature of this disease, our treatment must be chiefly palliative; we attempt rather to avert danger, than to effect a cure. Our object, therefore, is threefold;—to subdue febrile and inflammatory symptoms, to allay irritation, and at an advanced period of the disorder, to break the habit, or remove the nervous sensibility, upon which, its occasionally protracted continuance, appears to depend. Perhaps in every case of whooping-cough, some degree of febrile or inflammatory disturbance is observable, but in a large majority of patients, this is of very short duration, and moreover so inconsiderable, as to attract but little attention; all that is really requisite, being to prevent further mischief by gentle laxatives, by enjoining a bland and moderate diet, and by preserving the patient from exposure to cold and damp. Nevertheless, when consulted very early, even in slight cases, it will always be prudent and safe on the part of the practitioner, to adopt antiphlogistic measures, with a view to counteract the tendency to bronchitic and pneumonic inflammation. After administering an ipecacuanha emetic, and clearing the bowels by means of some

gentle mercurial laxative, the patient may be directed to take a grain of calomel and a grain of ipecacuanha every night or every night and morning, giving at the same time a diaphoretic mixture of the liq. am. acet., containing from half a grain to a grain or more of the extr. conii or extr. hyoscyami, according to the age of the patient, with or without from one to three minims of tinct. digitalis. In other cases, instead of giving the ipecacuanha along with the calomel, the vin. ipecac. or the vin. ant. pot. tart. may be added to the mixture, to the extent of from three or four to ten or fifteen minims for a dose.

When, however, the febrile symptoms are acute, or when, from the hurry of respiration, the expansion of the nostrils, the lividity of the lips, and the physical signs, we ascertain the existence of thoracic inflammation, we must, in addition to a strict observance of the antiphlogistic regimen, have recourse to depletion, either by venesection, cupping, or leeching, according to the age and constitution of the patient; always remembering that mere bronchitic inflammation less urgently requires depletion than either pneumonia or pleurisy. After depletion, the exhibition of calomel and of the diaphoretic mixture already noticed, may be commenced, and continued to the same or to a greater extent, so long as the urgency of the symptoms shall appear to require it. In short, both as it regards depletion, internal remedies, and external applications, the disease is to be treated precisely in the same manner as if the complicating disease were of the idiopathic kind.

As soon as the febrile and inflammatory symptoms have been subdued, the patient may have an ipecacuanha emetic administered twice or thrice a week, and take a

draught containing from five to fifteen grains of potas. carb., with a proper quantity of the extr. conii or extr. hyoscyami, thrice a day. When the disease is more advanced, and especially when the child has passed his fourth or fifth year, the milder preparations of opium, as being more powerful, may be substituted for the conium and hyoscyamus. Of these, the syrup of poppies, the tinct. camph. co., or very minute doses of the morphiæ hydrochlor. are perhaps the most eligible. Camphor, musk, hydrocyanic acid, and cantharides have each been more or less recommended and relied upon by certain practitioners in this disease. Besides internal remedies, various stimulating and anodyne embrocations rubbed on the chest or over the spine have, especially at an advanced period of the disorder, been found of considerable service. For this purpose the lin. ammon. fort., the lin. sapon. co., or the lin. camph. co., with tinct. opii, in the proportions of two drachms of the latter to an ounce of one of the former, may be freely applied night and morning. Roche's embrocation, said to consist of olive oil with half its quantity of the oils of cloves and amber, and Struve's lotion, consisting of a drachm of tartar emetic dissolved in two ounces of water and an ounce of tinct. cantharid., have in like manner long been in use as popular remedies.

Should mischief threaten the brain, as indicated by knitting of the eyebrows, drowsiness, contraction of the thumbs, stupor, or convulsions; besides the means calculated to diminish the obstruction in the lungs, it will be prudent to apply a few leeches to the temples, cold evaporating lotions to the scalp, and occasionally a small blister to the nape of the neck or behind the ears. When all febrile and inflammatory symptoms have vanished; and when, perhaps, after six, eight, or ten weeks the dis-

ease appears to continue from mere habit or from nervous irritability of the parts originally involved; we must combine with anodynes, such remedies as are calculated to improve the tone or strength of the patient. Of these cinchona, quinine, chalybeates, sulphate of zinc, and the cold bath, are the most successful; whilst in every instance, frequent change of air will be found greatly to promote the complete and permanent removal of the disorder.

DILATATION OF THE BRONCHI AND EMPHYSEMA OF THE LUNGS.

These two morbid conditions are perhaps in every instance merely physical consequences of some antecedent disease. They are morbid conditions with which, nevertheless, it is of importance to be well acquainted, not only because they are of extremely frequent occurrence, but because when once produced, they give rise to signs and symptoms calculated to obscure diagnosis, and moreover greatly modify the character of other diseases affecting the pulmonary apparatus.

Dilatation of the Bronchi.

Dilatation may be limited to a single tube; more commonly, it involves several at the same time: it may affect the tubes of one or more lobes, or of one or both lungs. It is most frequently met with in the superior lobe, and affecting a few of its tubes only. It presents very different appearances in different cases: sometimes, on slitting up the tube and tracing it from its trunk to its smallest ramifications, we find that at a certain part, it begins to enlarge; this enlargement either proceeds till it presents the appearance of a cul de sac, probably with

several openings of minute tubes through its parietes, resembling mere foramina; or the dilatation is presently succeeded by a narrowing of the tube, which may either pass on in the normal manner to its termination; or may again become dilated and narrowed for an indefinite number of times. Sometimes we find only a single dilatation, varying in size from that of a pea to that of an almond; in other instances, several tubes being affected in this manner at the same time and in the same situation, we have somewhat of a honeycomb appearance produced,—an appearance not unfrequently mistaken for a multilocular vomica. Dilatation is most considerable in the membranous bronchi; occasionally, however, it is sufficiently obvious in the more dense and even in the cartilaginous tubes. The lining mucous membrane is sometimes attenuated, sometimes thickened, and frequently secretes a mucous or muco-purulent matter, which is now and then observed to be extremely offensive to the smell. In every instance, the lung immediately surrounding the dilatation, is more or less condensed, and takes on the dark, flabby, and fleshy appearance of a lung long compressed by serous effusion within the chest, an appearance becoming exceedingly obvious when the dilatations happen to be numerous and considerable.

Diagnosis.—Since in this affection we have, as in phthisis pulmonalis, a cavity, or what is equivalent to a cavity, together with condensed lung immediately surrounding that cavity, we cannot be surprised that auscultation should detect bronchophony, bronchial respiration, and pectoriloquy, with cavernous respiration and cough; and as this cavity and the tubes in communication with it, are more or less filled with mucus, we ought, as in phthisis, to find, and actually do find, the mucous and gurgling

rattles. Percussion, too, as in phthisis, often elicits a dull sound over the parts affected, whilst in both the *souffle* may be present, and in both the expectorated matter may be offensive to the smell. All the signs and symptoms, therefore, of this morbid condition of the lungs bear a close resemblance to those of phthisis, from which it is only to be distinguished by a diligent inquiry into the history of the case, and by minutely investigating and attentively watching the character and progress of the general and local symptoms. The bronchophony and tubular respiration arising from this state of parts may, both in acute and chronic affections of the lungs, lead to a mistaken belief in the existence of pneumonia advanced to hepatization. The previous history, however, together with the absence of crepitation and other signs and symptoms characteristic of pneumonia, will, with few exceptions, sufficiently attest the distinction.

With respect to the *cause* of dilated bronchi, it would appear to be in almost every instance occasioned by the lodgement and distending influence of mucous or puriform matter; hence its great frequency in chronic bronchitis, especially when attended with copious expectoration; and hence its more rare occurrence in cases of vomica, and of empyema communicating with the bronchi.

PULMONARY EMPHYSEMA.

This is of two kinds, the *vesicular* and *interlobular*. By *vesicular* emphysema is meant a dilatation or rupture of the air-cells of the lungs, a morbid condition which is in every instance, so far as we yet know, a merely mechanical consequence, either of impeded or of violent respiration. We accordingly meet with it most frequently in

chronic bronchitis, and especially in that form of it called dry catarrh, a variety in which the smaller tubes are principally the seat of the disease, and in which we often have associated with the bronchial inflammation, a strongly marked disposition to spasm. It is also a frequent consequence of whooping-cough, phthisis, croup, laryngitis, and spasmodic asthma.

The appearances presented by an emphysematous lung, vary considerably, according to the degree and extent of the affection. It may take place to a greater or less extent in one or in both lungs, and is generally most considerable as well as most obvious towards the acute edges, which are more or less rounded, and as if inflated. The enlarged cells may in most instances be readily distinguished on the surface of the lungs, through the transparent pleura, somewhat resembling extremely minute bubbles of water, as seen through a thin sheet of ice. The enlargement presents itself in various degrees, from the size of a millet-seed, or less, to that of a pea; whilst in some rare instances it equals that of a nut, an egg, or even a large orange. When small, they do not project beyond the surface of the lung; when large, they occasionally rise considerably above it, the elevated pleura forming a sort of bladder, or cyst, which is found to dip more or less deeply into the pulmonary tissue. These larger elevations, however, most frequently present themselves suspended from the edges or base of the lung, where there are often several of them existing at the same time, presenting the appearance of semiopaque bladders of various shapes and sizes, and attached either by a broad base or by a narrow neck of pleura.

On laying open the chest of a person affected with vesicular emphysema, the lungs do not as usual speedily

collapse, but, on the contrary, are scarcely observed to subside at all, and in extreme cases actually start from the opening made, on removing the sternum and cartilages of the ribs. The air contained in the lungs escapes with considerable difficulty, so that pressure made with the hand fails to force it out, the lung in consequence feeling very much like a down cushion. Even after the organ has been cut, the escape of the air is comparatively slow upon pressure. The affected portion appears paler and dryer; in short, more bloodless than natural; as if the violence which produced the rupture of the air-cells, had at the same time, obliterated the vessels of the injured parts. In some instances, nevertheless, a little blood is found occupying the interior of the cavity occasioned by emphysema. If we thoroughly dry an emphysematous lung, by moderately inflating, and suspending it for some time, in the air; we discover on cutting the dried tissue with a sharp knife, sufficient evidence of the vesicular-looking cavities having resulted from rupture of the parietes of the air-cells; for we can trace the cavities passing insensibly into the deep tissue of the organ, whilst the remains of the ruptured cells are distinctly observable, in the form, either of slender threads stretching across in various directions, or of thin and narrow membranes, adhering to the sides of the respective cavities.

Physical signs.—There is preternatural resonance on percussion being made over the affected parts, auscultation at the same time detecting either a feebleness or a total absence of respiratory murmur. There is occasionally heard during inspiration, or rather at the commencement of the act, a sound resembling that produced by the inflation of a dried bladder, and which has not inaptly been called the *dry crepitation of large bubbles*.

The rest of the auscultatory signs will necessarily vary with the kind and degree of the bronchial or other complication ; for although it most probably does occasionally occur, the *frottement ascends et descendens* observed in the interlobular variety, has not yet been generally recognised as a sign of vesicular emphysema. When the disease is very considerable both in degree and extent, it sometimes alters the form, or interrupts or deranges the movements of the chest. The intercostal spaces may thus be made to protrude, or the whole of one or both sides of the chest rendered more prominent and rounded than natural, and the movements of the two sides unequal and irregular.

Symptoms.—Dyspnœa or shortness of breath being its most prominent and constant symptom, vesicular emphysema numbers with the many diseases which have been indiscriminately and erroneously designated asthma. There is, however, not only dyspnœa, but in many cases a peculiar mode of breathing ; the inspirations being short and quick, and performed at the extreme elevation of the ribs ; whilst the expirations, on the contrary, are remarkably slow, wheezing, and laborious ; the lungs become as it were over-inflated with air, which can only very partially and with difficulty escape, so that at length, they neither admit nor expel a sufficient quantity for the healthy purposes of life, and the patient is threatened with asphyxia. Cough, is pretty uniformly present in a greater or less degree ; nevertheless, both the cough and expectoration, necessarily vary with the kind and degree of the bronchial complication. The face is generally pale, perhaps with a slight degree of livor of the lips ; or, when complicated with chronic bronchitis and copious secretion, the whole countenance becomes bloated and almost purple, whilst the eyes appear prominent, watery, and bloodshot.

Diagnosis.—The probable complication of vesicular emphysema with other diseases of the respiratory organs, ought to be carefully remembered in exploring the chest, and in estimating the real severity of the more recent disorder; since it may otherwise obscure our diagnosis, and never fails to add considerably to the accompanying dyspnoea.

When unattended by much cough or expectoration, as is commonly the case when complicated with dry catarrh; it is liable to be confounded with purely spasmodic asthma. But although when thus complicated there is often a remarkable tendency to spasm, it may in general be distinguished from genuine asthma, by the history of the case, by the signs of bronchial obstruction furnished by auscultation, by these signs persisting, together with preternatural resonance and deficient respiratory murmur, in the intervals of the attacks of dyspnoea. From pneumothorax, in which there is also preternatural resonance, it is to be distinguished by the history, and by the complete annihilation of the respiratory murmur, and indeed of all respiratory sound, whatever, in the latter. When confined to one lung, the comparative dullness on percussion of the opposite side, may lead to a mistaken belief, that disease exists there. Auscultation, however, can hardly fail immediately to expose such a source of error.

As vesicular emphysema is, perhaps, uniformly a mere effect of other diseases, its appropriate treatment almost entirely merges in that which is applicable to them; the ultimate object, however, being in every instance, to remove as far as possible the cough and every cause of obstruction; to allay irritation by the employment of anodynes; and to lessen the general susceptibility, by gentle tonics and a well-regulated diet and regimen.

By *interlobular emphysema* is meant an infiltration of air into the interlobular cellular tissue, or into the cellular tissue surrounding the large vessels of the lungs, the air occasionally extending from thence to the posterior mediastinum, to the neck, and external parietes of the chest. Unless it arise from external injury and consequent wounds of the lungs, this comparatively rare disease, would appear in every instance to be produced suddenly, during some violent effort made by the individual; hence its occurrence in the adult, from attempts to lift a heavy weight, and from excessive straining at stool or during parturition, and hence its occurrence in infants from fits of crying, gusts of passion, and the laborious or interrupted respiration incident to some cases of whooping-cough and croup. Although supposed to arise from the accidental rupture of one or more air-cells, neither its place nor mode of escape into the cellular membrane, has been clearly made out on inspection after death; and what is very remarkable, it rarely if ever accompanies ordinary vesicular emphysema. On examination, we find that the narrow white lines of dense cellular membrane which naturally unite the lobules together, and which by their interlacings, produce the lozenge-like figures on the surface of the lungs, have undergone a change; they are, as it were, dilated and expanded, and present an appearance of inflated canals proceeding in different directions on the surface of the lungs, dipping down into their substance, and varying from a line or two, to perhaps half an inch or more. These inflated canals sometimes present an uniformity of surface; at other times, they appear to be made up of separate dilatations of the cellular membrane, strung together like so many pearls. Contrary to what is observed in vesicular emphysema, a little air occasionally

escapes beneath the pleura beyond the interlobular spaces, and may be made to move from place to place by the pressure of the finger.

Physical signs.—The pathognomonic signs of this affection, are, the dry crepitation of large bubbles, and the *frottement ascends et descendens*, or rubbing sound on the ascent and descent of the ribs, detected by auscultation. The patient himself is occasionally conscious of the crepitation, and the practitioner may now and then feel it by simply pressing his finger between the ribs above the parts affected. By percussion, a naturally, or perhaps a preternaturally clear sound is elicited. Of course when the air finds its way into the cellular membrane of the neck and chest, we have an emphysematous state of these parts.

The only *symptom* of importance to which it gives rise is great and sudden difficulty of breathing.

Diagnosis.—The dry crepitation of large bubbles, the ascending and descending rubbing, and the clear sound on percussion, together with the suddenness of the attack of dyspnœa, will in uncomplicated cases leave little room for doubt or difficulty. It must be remembered, however, that certain of the signs and symptoms may be obscured by accidental complications. Pneumo-thorax often comes on suddenly with great difficulty of breathing, and is also attended with a clear sound on percussion; but pneumo-thorax most frequently supervenes on phthisis, or some other disease of the lungs; the ribs are quite immoveable, or nearly so; the crepitation and rubbing are absent; all respiratory murmur is annihilated, unless old adhesions exist; and a faint tubular respiration may sometimes be heard.

The disease, though sudden in its attack and alarming

in its immediate effects, seldom requires any material interference; the extravasated air appears in general to be quickly absorbed; and all that is necessary is to make a few small punctures through the skin with the point of a lancet, when the emphysema extends to the neck and chest.

PNEUMONIA, OR PERIPNEUMONIA.

PNEUMONIA may be defined to be an inflammation of the air-cells of the lungs, speedily producing an effusion into them, of a serous-looking fluid commonly mixed with blood; causing, if unchecked, such a degree of thickening of their parietes as apparently to fill them up entirely for a time; or leading to the deposition of an albuminous matter, which is either solid or of a puriform character; and seldom, if ever, terminating in the formation of a genuine abscess.

Both the general and local symptoms of pneumonia vary considerably, according to the intensity of the attack, and the age and constitution of the individual; but more particularly, according to the extent to which the bronchi happen to be involved in the inflammatory process. In its simplest form; after chilliness, shivering, feebleness, and depression, the patient experiences for the most part, strongly marked symptoms of febrile reaction, giddiness, confusion, and sometimes intense pain in the head; occasionally delirium, especially towards night; the skin acquires a remarkably pungent heat, generally accompanied by dryness, more rarely by moisture; the pulse is full and strong, perhaps labouring and sluggish; the face is usually more or less suffused with a livid or deep crimson flush, accompanied by an expression of distress; the tongue is foul,

its substance is more injected than in ordinary phlegmasiæ, and in a short time it manifests a tendency to become dry and brownish; the respiration is more or less hurried; but there is seldom pain or any very obvious cough or expectoration, and sometimes none at all; the entire assemblage of symptoms bears a striking resemblance to those of a common continued fever, and often, especially in the aged and cachectic, take on a considerable degree, of the typhoid type.

In a large majority of cases, however, occurring in moderately good constitutions, the smaller bronchi are involved; so that, together with the symptoms enumerated, we have both cough and expectoration, as well as more strongly marked pain and difficulty of breathing. But even in this more common form of the complaint, neither the cough nor the pain is by any means very urgent, whilst the expectoration is for the most part exceedingly scanty. This scanty expectoration of pneumonia, presents physical characters in a great measure peculiar to, and characteristic of, the complaint. It is so remarkably viscid that it will often adhere to the sides of the containing vessel like so much semifluid gum, and with such pertinacity, that although tremulous, it cannot be made to quit its situation either by reclining or inverting the vessel.

These small viscid masses frequently contain air-bubbles, and present considerable variety of colour, being sometimes semitransparent and pearly or greyish, like the thickest mucilage; at other times, according to the quantity of blood with which it is so often mixed, we have it of a sea-green, apple-green, gamboge yellow, rusty brown or reddish colour; and indeed in some instances, the matter expectorated, appears to consist almost entirely of

blood, when it is perhaps equally or even more copious, but of course less viscid.

When the bronchitic complication is still more considerable, the wheezing and dyspnœa are more urgent, the cough more frequent and violent, the pain or soreness more distressing, and the expectoration much more copious. In such cases the characteristic appearances of the pneumonic expectoration, are often altogether lost amidst the abundant bronchial secretion, or perhaps we find the whole of the latter tinged of a brownish or saffron colour, by the admixture of blood usually observed in the former.

Such are the symptoms usually attendant on the ordinary forms of pneumonia; but although in enumerating and arranging them, it would appear that their severity is to a certain extent determined by the degree of bronchial complication; it is nevertheless true, that without either bronchial or pleuritic complication, the distress of breathing is in some rare instances, extreme; and in a short time, amounts almost to a state of orthopnœa. We have found this form of the complaint associated in a few cases, with myriads of miliary tubercles pervading both lungs, and proving fatal, either in the first or very early in the second stage of the disorder.

On *dissection*, the appearances differ according to the stage or period of the disorder at which death took place. In the first stage of pneumonic inflammation, we find the lung externally of a dark or violet colour, whilst internally, it presents various shades of red; it feels more substantial and resisting; it retains its tenacity; it still crepitates, but pits upon pressure; and on cutting into it, a considerable quantity of a thin, frothy, and often bloody fluid escapes from the incision; nevertheless the cellular

structure is still distinguishable. If advanced to the second stage, the lung is not in general so dark-coloured externally ; it feels quite hard ; it admits of neither pitting nor crepitation on pressure ; and in consequence of being no longer capable of collapsing, appears to be greatly enlarged. On cutting into it, it presents a solidified red mass, perforated here and there by bronchi, or variously intersected by the paler cellular tissue which unites the lobules together, and scarcely a drop of fluid can be squeezed out of it. It is so heavy as to sink in water ; but although hard as well as heavy, its cohesion is manifestly impaired ; it is more brittle, and readily breaks down under the pressure of the finger. If we tear a portion of it and hold the torn surface between the eye and the light, or examine it with a lens, the solid mass presents the appearance of innumerable minute rounded or oval grains heaped together,—an appearance manifestly resulting from the filling up of the cells. This condition of the lung constitutes what has been called red hepatization.

If the inflammation have further advanced ; the lung on being cut, presents the same hardness and granular structure, but its colour is changed, having become a pale grey. With this change of colour, there is usually a further diminution of cohesion, with an increase of moisture of the pulmonary tissue, and a little fluid albuminous matter may be seen to ooze out at a few points, on pressing it. The grey surface has very commonly interspersed through it, small insular portions of black matter, which are usually considered to be carbonaceous pulmonary matter, but we believe, not unfrequently consisting of the truncated extremities of small branches of the pulmonary artery ; or at least, of vessels containing dark blood. The appearances

of the lung just described, constitute the grey hepatization of authors.

In proportion as the albuminous deposit softens down, or in proportion to its more decidedly puriform character when first effused, the cut lung is found more of a straw or yellow colour, more moist, and easily lacerable; sometimes breaking down into a semifluid puriform mass from the slightest pressure.

The morbid appearances produced by pneumonia, may be found pervading either the whole of a lung; or, a greater or less portion of it; or, may be limited to distinct and separate lobes; constituting lobular pneumonia.

The smaller bronchi are usually found redder than natural, and containing variable quantities of viscid, mucous, and perhaps coloured secretion; in other instances these appearances extend to the larger tubes, and sufficiently attest a bronchitic complication. Another very frequent complication, is pleurisy; indicated by a greater or less quantity of turbid serum effused into the pleural cavity, or by a layer of albumen spread over the pleura covering the inflamed part of the lung; or by both of these appearances at the same time. When, however, the lung is very extensively consolidated, it would seem, by its pressure, to counteract the tendency to effusion; so that in general, neither the serous nor albuminous effusion is considerable under such circumstances.

Abscess of the lung from acute pneumonia, is of extremely rare occurrence; and it is probable that of those cases in which it is said to have happened, many of them at least, have been attended with some overlooked source of fallacy. Certain it is, that the softening down of albuminous matters previously deposited in the lungs; dilatation of the bronchial tubes; interlobular suppuration; and even

the appearance of a softened lung, on being violently torn from an adherent pleura, have all led to erroneous conclusions on this matter. Gangrene, from acute pneumonia, is, at least, equally rare.

If an opportunity present itself of examining the body, when a lung, consolidated by pneumonia, is retrograding towards a recovery of its normal condition; we commonly find the cut surface of the portion previously hepatized, of a pale or pinkish hue; or we find it presenting a mixture of pale pink and grey; it is still more friable or lacerable than natural; and the cells are again more or less loaded with serous-looking fluid, rendered frothy by squeezing the lung, in consequence of the presence of a considerable number of air-bubbles.

It would also appear, that the further changes consist in the absorption of the effused fluids; a gradual increase of the tenacity of the pulmonary tissue; and a more or less complete restoration of the normal state. In some instances, however, when the albuminous matter thrown out is of the more plastic or organizable kind; it fails to be entirely absorbed; and part of it permanently remains. Under these circumstances, we find it at an after period, either in small, detached, and more or less rounded masses; or more extensively and more irregularly diffused through the pulmonary tissue. When distributed in small insulated portions, it constitutes one of the forms of albuminous deposit indiscriminately called tubercles; whereas, when more extensively and irregularly diffused, it has in like manner been regarded as a form of tubercular infiltration. The history, however, of the patient's case, in many instances; as well as the local appearances themselves; lead to the conclusion, that they are merely the result of a previous attack of pneumonia. We often learn

on inquiry, that at some former period, perhaps years before, the patient had had an attack of inflammation within the chest; whilst, if he die of some other disease, we almost uniformly discover on dissection, unequivocal evidence of antecedent inflammation. The evidence consists in thickening and adhesions of the pleura, especially in the neighbourhood of the appearances in question; together with induration and puckering of the pulmonary tissue immediately surrounding each albuminous deposit: or, when the deposit is irregular and extensive, we often have an actual deformity and puckering of the pleura above the infiltrated parts. This view of the origin of these albuminous deposits, will probably serve in some measure to explain why they are much less uniformly found in the apices of the lungs than ordinary tubercles. It has been observed that these deposits may remain passive for an unlimited period, and without undergoing any very appreciable change, except perhaps a conversion of some of them into calcareous or chalky masses, especially when deposited in the upper lobe of the lung; it would nevertheless appear, that the vital influence by which they are maintained in their integrity is so extremely slender, that if inflammation happen to be set up around them by any accidental cause; and especially if the vital powers of the patient have been greatly impaired; that influence is so far exhausted, that they lose their cohesion and soften; the softening commonly first taking place in those portions most remote from the more highly organized living structures: they soften in the centre; the softening proceeds outwards, and in the end causes the formation of a vomica; and so produces one of the modifications of phthisis pulmonalis.

Physical signs.—The earliest physical sign discover-

able in pneumonia, is the crepitating rattle heard on auscultation, and especially during the act of inspiration. This sign is highly characteristic of pneumonia, and is indicative of what is regarded as the first stage of the disorder, or that in which the air-cells are found loaded with a serous-looking fluid. At this time, there is little or no dullness on percussion, because although the affected lung is loaded with fluid, many of the cells continue to admit or retain a considerable proportion of air. When the disease has advanced to consolidation, we perceive more or less dullness of sound on percussion; whilst auscultation detects bronchophony and bronchial respiration; both of these signs being of course most striking when consolidation extends to the surface of the lung: whereas when the consolidation is deep-seated, or confined to separate lobules, neither bronchophony nor bronchial respiration may be audible; or the latter probably is heard in the distance, unaccompanied by bronchophony: but wherever bronchophony is heard, bronchial respiration is present also. In the complete consolidation of simple pneumonia, the bronchophony is usually clear and unmixed; or, at most, blended with some remains of crepitating rattle: according, however, to the extent of bronchitic complication, we find it accompanied by the mucous, sonorous, and sibilant rattles in ever-varying degrees and proportions; but all of them rendered remarkably distinct in consequence of the lung when hepatized being a better conductor of sound. Indeed the mucous rattle attendant on pneumonic consolidation becomes in some instances from the latter circumstance, remarkably striking and characteristic, each inspiration conveying to the ear of the auscultator a sound resembling that produced by raising a flat fish from a moist and unctuous slab; or perhaps a

sound so coarse, as rather to resemble the whizzing and gurgling occasioned by a cow suddenly raising its flat foot out of a mass of mud. In other instances, we have the bronchophony so modified by pleuritic effusion, as to take on something of the character of œgophony; and most commonly, that form of it which has been compared to the voice of Punch.

When the pleuritic effusion happens to be very considerable, we still have the voice, as it were, concentrated into a bronchophony; but are conscious that it is distant from the ear; bronchial respiration being in general faintly heard at the same time. In some rare cases, we observe that sort of puffing or masked puffing which conveys to the auscultator, the idea of a stream of air being drawn from his ear at each inspiration made by the patient, whilst during expiration he feels as if the patient blew into his ear; only that in both instances, the physical impression that ought to be made upon the ear, is absent. In almost every instance, the respiratory murmur of the sound portions of the lung, is rendered more or less puerile.

Diagnosis.—It has been alleged that pneumonia in its simple form is easily recognised; and this is undoubtedly quite correct, if we regard the disease as existing in its simplest form, when it presents the symptoms usually enumerated; but as the truly simple form of pneumonia is very frequently altogether unattended by either cough or expectoration, or they are present only in a very slight degree, it is by no means in every instance very easily recognised by those who are not in the habit of employing the stethoscope; and indeed the stethoscopist himself is occasionally thrown off his guard by the absence of those functional signs which he has been taught

to regard as characteristic of the least complicated form of the complaint. Accordingly it has been found that simple pneumonia in its acute form, and occurring even in good constitutions, is by no means unfrequently mistaken for common continued fever, and for certain affections of the brain.

Notwithstanding its resemblance, however, to an attack of continued fever, attentive observation will in most cases enable us to recognise the difference. The attack, in general, is more abrupt, and often follows some manifest exposure to cold or wet. The countenance, though congested and somewhat distressed, has not the dejection and stupidity so remarkable in fever; it displays more intelligence; and although confused and perhaps slightly delirious, the patient on being roused commonly evinces a clearness and vigour of intellect not found in fever. The condition of the tongue also furnishes a valuable diagnostic sign. We know that at the onset of fever the contrast between the vividly-injected tongue and its white or grey fur is very striking; it is in general much less so in pneumonia: in the latter it may be said to present rather the tongue of a phlegmasia. The hurry of respiration in pneumonia is often not more than we commonly perceive amid the general distress of fever, and it may be repeated that neither cough nor expectoration is necessarily present in a very appreciable degree. But of all the symptoms of pneumonia, the most constant and conclusive in a diagnostic point of view is a pungent heat of the surface: by this symptom alone the first stage of pneumonia may in most instances be readily recognised; by this symptom alone pneumonia has been repeatedly pronounced to exist, before asking a single question, or making the slightest stethoscopic examination of the

chest. The presence of this symptom will seldom mislead even in the most complicated forms of inflammation within the chest. It is by no means contended that it is necessarily present at some period of every case, although that is not improbable; but it may be safely affirmed that when inflammation is confined to the chest, however varied may be the tissues involved in the inflammatory process, provided this symptom be present, pneumonia may be confidently pronounced to form a part in nineteen cases out of twenty, and perhaps in a larger proportion. A similar pungent heat of the surface is now and then observed in certain forms of renal dropsy; more frequently in continued fever, especially in children; and still more commonly in the eruptive fevers of the exanthemata and erysipelas; and as such cases may supervene upon already existing disease within the chest, the fact ought to be carefully remembered.

The sympathetic affections of the brain which have occasionally been induced by simple pneumonia, are intense pain in the head in the young and robust; a state approaching to delirium tremens or to maniacal incoherence, especially in the aged and intemperate; and convulsions or symptoms of hydrocephalus in infants and children.

The ordinary form of pneumonia is to be distinguished from bronchitis by the aspect of the countenance, by the pungent heat of surface, by the character of the expectoration, and by the crepitating rattle in the first stage; and by the bronchophony, the bronchial cough and respiration, and the dullness of sound on percussion, in the second stage of the disorder. The same symptoms, together with the absence of stitch in the side, will serve to distinguish pneumonia from pleurisy. When, however,

pleurisy is advanced to effusion, the bronchophony bronchial respiration and dullness of sound on percussion, to which it then gives rise, are more likely to mislead, as all these signs are observed in pneumonia advanced to hepatisation. In genuine pneumonic consolidation, however, the bronchophony is loud, clear, and unmixed, whilst in pleurisy with effusion the bronchophony is usually so modified as to take on more or less of the character of cegophony, or of the sound which so closely resembles the croaking or squeaking voice of Punch. The extent of the dullness of sound, and the rapidity with which it has supervened, must also be attended to: in pneumonia, the dullness is neither so extensive nor so rapidly induced as in pleurisy.

In cedema of the lungs, we have the crepitating rattle indicative of the first stage of pneumonia; but the history of the case, the state of the patient's constitution at the time, together with the absence of the general and local symptoms peculiar to pneumonia, will in general enable us readily enough to distinguish the two diseases. Pneumonia may supervene upon bronchitis, and is a very frequent consequence of phthisis pulmonalis and of pulmonary apoplexy; but the symptoms of these respective diseases will sufficiently declare the nature of the complication.

The *prognosis* is to be drawn from a due consideration of the severity of the attack, the extent and period of the disease, but especially from its being simple or complicated, and from the age and constitution of the individual. When of moderate extent, when professional assistance is early sought, when the patient is young and of a moderately good constitution, and when the disease is uncomplicated, little apprehension in general need be enter-

tained; the danger attendant on simple pneumonia having been perhaps somewhat overrated. If, however, the disease attack a considerable portion of one or both lungs, if early remedies have been neglected, if the patient be advanced in years or of a broken-down or cachectic habit of body, or if the disease be complicated with extensive pleurisy or bronchitis, it becomes at all times a serious and frequently a fatal disorder. In any individual case, the unfavourable symptoms are, delirium or other oppression of the brain, great hurry of respiration, a livid aspect of the countenance, and a rapid jerking but small and compressible pulse. When the breathing becomes less hurried, the hue and expression of countenance more natural, when the pulse diminishes in frequency and loses its jerking character, when the surface is bedewed with a gentle but equable moisture, or when the urine deposits a lateritious sediment, it generally indicates a change for the better. With respect to the state of the expectoration as a prognostic sign, it may be fairly observed, that we derive more assistance from the freedom and facility with which the secretion is rejected, than from its mere appearance; for there does not seem to be any very constant or uniform relation between the character of the matter expectorated, and the period or stage of the disorder. When, however, the expectoration early and suddenly ceases, it is unquestionably an unfavourable sign, inasmuch as its cessation under such circumstances generally indicates either a considerable loss of power on the part of the patient, or such complete obstruction of the air-cells as no longer to admit a quantity of air sufficient by its volume to expel the secretion; whilst for the opposite reasons a free and easy expectoration augurs more favourably.

Causes of Pneumonia.—The causes which predispose

to pneumonia are involved in much obscurity; individual idiosyncrasy, epidemic influence, and a previous attack of the disease, are perhaps the most powerful. It is most prevalent in cold and changeable climates and seasons; it makes its attack at every period of life; infants are exceedingly prone to it; it is frequently met with in adults, especially those exposed to hardship and fatigue, and is by no means uncommon in the aged and infirm.

Although pneumonia not unfrequently presents itself without our being able to trace either the predisposing or exciting cause; nevertheless, in a considerable majority of cases it is observed to succeed sooner or later some unusual exposure to cold, especially when combined with moisture. It is very often excited in infants by the irritation of teething, and of course may be induced in any person at any time by mechanical violence or by the accidental entrance into the lungs of matters capable of irritating by their bulk, by their acrimony, or by their temperature. It frequently supervenes in the progress of measles, whooping-cough, phthisis, pleurisy, bronchitis, influenza, pulmonary apoplexy, and occasionally, disease of the dorsal vertebræ. It has appeared in some instances to arise from metastasis of gout and rheumatism, and is said to have been occasionally excited by certain animal and mineral poisons.

Treatment.—In acute pneumonia, the treatment generally, must be purely and promptly antiphlogistic. The patient should be confined to bed, put upon slops, prohibited from talking or using any exertion, and his apartment maintained at a moderate but steady temperature; taking care at the same time, to secure a pure and wholesome atmosphere by good ventilation, so admitted as not to expose him to a draught or current. The

earliest, most important, and most powerful remedy is undoubtedly venesection, carried to an extent varying with the age and constitutional powers of the patient, the severity, extent, and period of the disease, and with the absence or presence of complication. When the patient is young and of good constitution, when the attack is severe and the inflammation extensive, when we are called early and there is no considerable complication, blood may be taken from a free orifice and allowed to flow till the approach of syncope. Immediately after such a bleeding, from five to ten grains of calomel, with a grain or a grain and a half of opium, may be given, and repeated to the same, or perhaps, what is better, to half the amount every four or five hours, with or without the addition of a quarter of a grain of tartar emetic, or a grain or grain and a half of ipecacuanha. Should the hurry of breathing, the heat of skin, and state of the pulse indicate its propriety, the venesection may be had recourse to a second time on the same or following day. As it regards the pulse, however, the obstruction to the circulation through the lungs sometimes renders it fallacious; it is therefore better to be guided in depleting by other symptoms, and by the general condition of the patient.

When the disease has advanced to hepatization, or when complicated with a considerable degree of bronchitis, venesection must be employed with greater reserve, for in the latter case it is of great moment not to reduce the patient's strength too much, and experience has shown that copious bleeding is not only less effective but is moreover less safe in the second stage of the disorder. In such cases, the patient may be placed in a more or less upright position, in order to induce faintness by a comparatively moderate loss of blood. Similar or even greater

reserve and caution in regard to depletion, will be required in cases occurring in the aged and in persons of an infirm or cachectic habit of body. In the treatment of such subjects, should any doubt arise as to the propriety of blood-letting, local depletion by cupping, will prove an admirable substitute. Some recommend leeches, but in the adult at least, they are by no means so powerful or effective as cupping.

When the mercurial combination does not act upon the bowels, they may be relieved daily by interposing a dose either of senna and salts or of castor-oil, or in some instances, a purgative enema. Blisters and other counter-irritants have often appeared to be of considerable service, but in general it is desirable to postpone their application for a day or two, or till the activity of the disease has been somewhat subdued by the more energetic measures already recommended.

As auxiliaries, other gentle means may be employed to promote the various secretions and excretions. For this purpose, the liq. ammon. acet. mixture, with fifteen or twenty minims of antimonial or ipecacuanha wine, may be given three or four times a day. To this combination may be added occasionally, from five to ten minims of the tincture of digitalis. If, however, there be any tendency to sickness, the effervescing draught with an excess of alkali may be substituted, or the effervescing draught may be allowed for common drink; whilst if there be profuse sweating, the diaphoretic part of the treatment may be withdrawn, and the calomel and opium given alone.

As soon as the system has been brought freely under the influence of mercury, if the disease be proceeding favourably, the calomel may either be altogether suspended or only given in small doses and at distant inter-

vals ; but in every instance, and especially when hepatisation has taken place, or when the disease is complicated with pleurisy, it is desirable to maintain a moderate degree of soreness of the mouth for several days, or even weeks in some instances.

The antimonial or contra-stimulant treatment of pneumonia, consists in administering, after moderate depletion, large and frequently repeated doses of tartar emetic. It has been less employed or relied upon in this country than abroad, but will nevertheless be found to produce very powerful effects, and has doubtless often succeeded in speedily arresting the disorder. If deemed advisable to try it, a grain or a grain and a half of tartar emetic may be given in two ounces of any simple vehicle every hour till the patient has taken six or eight such doses ; it may then be suspended for a few hours, and again repeated to the same or a less extent. The first dose often induces vomiting, the second probably mere nausea ; after which it frequently happens that no further uneasiness at the stomach is felt by the patient. It occasionally induces profuse perspiration, at other times it acts upon the bowels ; but what is not a little remarkable, its remedial power does not appear to be in any way necessarily connected with its effects upon the secretions, inasmuch as it has proved equally efficacious where no such effects have been observed to result from its use. When it induces diarrhœa, therefore, it is recommended to add to each dose a little laudanum or syrup of poppies.

During what may be called the retrograde or convalescent period of the disorder, the appropriate treatment and general management of the patient will necessarily differ according to circumstances. Should there be much bronchitic complication, mild diaphoretics, demulcents,

anodynes and expectorants, and other means specified under the head of bronchitis, will be required; whilst in the more simple form of the disease, gentle mercurials, anodynes, and diuretics will constitute our chief resources. In every form we must guard against a premature use of tonics, stimulants, and strong food.

When habitual drunkards become the subjects of acute pneumonia, they often display considerable febrile and vascular excitement with very little power, or in other words, the disorder assumes a good deal of the typhoid type; they bear depletion very badly, and even have delirium tremens occasionally induced by it. In such cases, therefore, we must be sparing of bloodletting, and either endeavour by placing the patient in an upright position, to produce an impression by as little loss as possible, or be content to substitute local depletion by means of cupping. Our chief reliance under these circumstances must be in the employment of calomel and opium, and the other milder remedies mentioned. A grain of opium with a grain and a half of calomel, given every four or five hours, will probably be sufficient; it will, however, often be necessary at an early period to allow good nourishment, and sometimes porter, wine, or in extreme cases even spirits, according to the actual condition and previous habits of the patient. When simple pneumonia of an acute kind attacks the aged and cachectic, and takes on also much of the typhoid type, the treatment must be conducted on similar principles, only that there will be less necessity for having early recourse to fermented liquors; in both instances, however, the infusion of serpentary, given at first with the liq. ammon. acet., and afterwards with the sesquicarbonate of ammonia, will often prove of excellent service as an auxiliary.

In the acute pneumonia of infants, the treatment must

be conducted on precisely similar principles as in that of the adult, and will consist in bleeding, cupping, or leeching, according to the age and strength of the child ; the free administration of calomel in combination with either antimony or ipecacuanha ; gentle laxatives ; diaphoretics ; digitalis ; mild anodynes ; counter-irritants, and the warm bath.

Chronic Pneumonia.

A chronic form of pneumonia is by no means unfrequent in phthisis pulmonalis, around the softened tubercular deposits ; it occasionally results from pulmonary apoplexy ; but may also be a mere sequel of acute pneumonia imperfectly cured. In the latter case, it most frequently occurs in persons of impaired constitution or of intemperate habits. Whatever may be its origin, this form of pneumonic inflammation appears to produce in the pulmonary tissue, effects analogous to those observed to result from chronic inflammation in other parts of the body. The effused albuminous matter seems to become more or less perfectly organized, so that on examination after death we find the diseased lung remarkably dense, and in some instances almost of cartilaginous hardness ; the condensed lung is altogether impervious to air ; it is of a very dark colour, nearly approaching to black or occasionally greyish, somewhat like ordinary tubercular infiltration ; whilst the surrounding cells are in general more or less charged with a serous-looking fluid.

It is the chronic pneumonia succeeding to a previous acute attack, which alone merits a separate notice ; and even this form of the complaint is so extremely rare as to be of little importance beyond the possibility of its being mistaken for phthisis pulmonalis. The history of the

case, however, the character of the expectoration, the absence of any evidence of actual vomica, and the presence from time to time of the crepitating rattle, will probably serve to distinguish the disease in the very few instances in which such a doubt can arise. As it is mostly met with in bad constitutions, the treatment must be regulated accordingly, and may consist of mild mercurial alteratives, with anodynes and diaphoretics, gentle laxatives, digitalis, local counter-irritants, a bland but nutritious diet, and, if practicable, a removal of the patient to a more temperate climate.

GANGRENE OF THE LUNG.

Gangrene of the lung is a rare disease, and is distinguished in a peculiar manner by the putrid odour of the patient's breath, and of the matter expectorated, which so commonly attends it. It is either irregularly diffused over a considerable and variable extent of the pulmonary tissue, or it is circumscribed and limited to a small portion only, constituting a gangrenous eschar. It seldom or never results in either of its forms from an ordinary attack of acute pneumonia, although it is not improbable that some degree of inflammation precedes or accompanies it in every instance. It is most frequently met with in bad constitutions, and especially in those who are habitually intemperate, and who in consequence are exceedingly prone to have gangrene induced by comparatively slight causes.

When of the irregularly diffused kind, the gangrenous lung is found more humid than natural, softened, easily lacerable, occasionally almost liquefied, and of a dirty white, greenish, or dark olive colour; or from a mixture

of these colours with portions of dark red, a peculiar mottled appearance is produced. On cutting into it, a quantity of thin, sanious-looking, and greenish muddy fluid, of a most insufferably putrid odour, oozes out. This diffuse gangrene may involve a single lobe, or it may extend to the greater part of a whole lung; it sometimes passes insensibly into the sounder tissue, and is generally observed to be surrounded by lung in the first stage, or more rarely in the second stage of inflammation.

When of the circumscribed form, the gangrenous portion of lung is most frequently found of a dark green colour, extremely offensive to the smell, more humid but at the same time more firm than natural, and surrounded by lung in the first stage of inflammation. In other instances the gangrenous portion separates from the sounder tissues, and either remains like a moveable nucleus in the cavity thus formed; or softens down into a fluid, grey, or greenish mass, having a most offensive putrid odour, and giving rise to a vomica, which presently communicates with the bronchial tubes. A vomica thus formed, is sometimes found lined by a false membrane; in other cases, the inflamed and hardened pulmonary tissue itself forms the parietes of the vomica, and seems to pour out an offensive secretion. If the disease be not quickly fatal, such a vomica may induce hectic, rapid emaciation, and death, as if from phthisis; it has been known to open into the cavity of the pleura, occasioning death by pneumothorax; and in some rare cases the vomica has appeared to contract, cicatrize, and the patient recover.

Such are the appearances usually observed on dissection of those who have died with symptoms of gangrene of the lung; these appearances, however, in all probability differ according to the particular state of the lung at the

period of the attack ; for experience and dissections incline us to the belief, that in some cases at least of pulmonary gangrene, there had existed previous disease of the organ, and upon which some slight accidental inflammation, or a highly vitiated condition of the constitution, had induced a state of gangrene. We believe it to be in this way that tubercular or pneumonic deposits, and the remains of pulmonary apoplexy, occasionally lead to gangrene.

When unattended by fœtid breath and offensive expectoration, as occasionally happens, it is not likely to be recognised during the lifetime of the patient, although some suspicion of its existence may probably now and then be excited by the general prostration being disproportionate to the degree or extent of disease discoverable in the lungs by auscultation and percussion. When, however, the breath and expectoration are fœtid, when the latter is diffuent and purulent, or thin, sanious, and of a dirty white or greenish colour, little doubt can be entertained, especially if in addition, auscultation detect signs of the first or second stages of pneumonic inflammation, or of a vomica. It must nevertheless be remembered, that a person, particularly if intemperate in his habits, may have pulmonary inflammation attended with fœtid breath and offensive discoloured expectoration, without any evidence of actual gangrene of the lung ; and we have seen a case in which the stench of the breath and expectoration was such as to render the patient's apartment almost insupportable, but which nevertheless terminated favourably ; and on examination of the body a considerable time afterwards, no trace whatever of previous disorganization could be detected.

The treatment will obviously consist in supporting the

patient's strength by ammonia, bark, serpentary, opium, wine, porter, and sometimes brandy or gin, and by a good supply of nourishing food.

PNEUMOTHORAX.

By pneumothorax is understood an accumulation of air or gas in the cavity of the pleura. It is sometimes extremely difficult to determine precisely the source of the air so accumulated. Its most obvious as well as most frequent source, is unquestionably the lung of the side so affected, from which it escapes in consequence of a communication being established between the interior of the organ and the pleural sac. This communication may be occasioned by phthisical or gangrenous disorganization of the lung, and consequent rupture or destruction of the pulmonary pleura situated above the disorganized part; it may be produced by a wound, or by rupture of the air-cells and pleura, independent of either of these disorganizing processes; or it may be the result of an ulceration of the pleura excited by the presence of pleuritic effusion. The air or gas is said to be in some instances a product of the decomposition of morbid matters deposited within the pleuræ; and is even supposed to be occasionally, though more rarely, a secretion from the serous membrane itself. That it is most frequently derived from the lung, is proved by repeated dissection, but the other reputed sources are by no means so satisfactorily established; and it must be admitted that a communication with the interior of the lung, sufficiently large to allow the escape of a considerable quantity of air, may exist, without our being able to detect it by the most diligent investigation after death.

On *dissection* we either find the pleural cavity of the

side affected, simply containing air, or we have it partly occupied by air and partly by a serous and albuminous effusion in variable quantity and proportions. In prosecuting the inspection of the body, we uniformly observe that a quantity of gas, sometimes having an offensive smell, rushes out as soon as the knife has penetrated the chest; and on examining the interior, the lung, unless prevented by partial adhesions, is found compressed into a small space against the spine and mediastinum. When the cavity contains air alone, the pleura may be merely drier than natural; more frequently, however, it is covered with some form of albuminous deposit, and especially so when there also exists more or less fluid effusion.

In every case of pneumothorax there is more or less dyspnœa. This dyspnœa may come on suddenly, and is then occasionally of extreme urgency, especially if, as often happens, there previously existed phthisical or other serious disease of the lungs. There may also be protrusion of the ribs, and even displacement of parts, according to the quantity of air, or of air and fluid effused; the other physical signs necessarily varying with the immediate cause of the disorder. When air alone is effused, we have impaired mobility of the ribs, preternatural resonance on percussion, and total cessation of all respiratory murmur, except in a small space between the scapulæ. If fluid be mixed with the air, then, in consequence of the fluid gravitating, whilst the air ascends, we have preternatural resonance above, dullness of sound below, and occasionally metallic tinkling; whereas if a decided communication exist between the pleural cavity and bronchi, we detect both metallic tinkling and the amphoric sound.

The pathognomonic sign of pneumothorax is a combination of clearness of sound on percussion with complete

obliteration of respiratory murmur everywhere, except in a small space between the scapulæ. This peculiarity is quite sufficient to distinguish the disease in every instance. In vesicular emphysema, the clearness of sound is attended with merely a diminution of the respiratory murmur. The metallic tinkling and amphoric sound may accompany any such disorganization of the lung as causes the formation of a vast cavity communicating with the bronchi, and consequently containing a mixture of air and fluid; but such cases are not very common, and the history and accompanying symptoms will at once declare the true nature of the disorder. It must not be supposed that disease exists in the sound side because it happens to be less resonant than the other,—an error, however, which auscultation will instantly correct; neither must it be forgotten, in examining the left side, that fluid and flatus in the stomach may give rise to great resonance on percussion, and metallic tinkling.

The treatment of pneumothorax will depend entirely upon the nature of the disease with which it happens to be associated. Cases of pneumo-thorax, independent of organic or other serious disease of the lungs or pleura, are extremely rare; and if they do occur, they will probably be attended with little danger, the air being gradually removed by absorption without much assistance from art. If in any case of pneumothorax the oppression of the breathing become alarming, it may be prudent or even necessary to perform the operation of paracentesis thoracis.

PLEURITIS, OR PLEURISY.

In order to acquire a correct knowledge of this disease, it is necessary to bear in mind that it consists in inflammation of a serous membrane ; that although this inflammation may probably diminish or suspend the secretion of the membrane in the first instance, it in a very short time leads to an effusion of serum and solid albumen ; that the quantity and relative proportion of these two products are much influenced by the intensity of the inflammation, but especially by the age and constitution of the patient ; that in young persons of good constitution, acute inflammation usually causes an effusion of a much larger proportion of solid albumen than when it occurs in scrofulous habits and in old and cachectic constitutions ; that in the former the solid albumen takes on organization, and the serum is absorbed with comparative rapidity ; that in the latter the serum is for the most part considerable in quantity, whilst the solid albumen is scanty, little capable of organization, and manifests a strong tendency to take on a flaky, granular, or puriform character.

Acute pleurisy is commonly indicated by a severe pungent pain in some part of the chest, dyspnœa, and cough ; these symptoms being, in most instances, preceded by chilliness, rigors, or shivering, and a feeling of general indisposition ; and accompanied or presently followed by heat of skin, thirst, a white tongue, and a frequent, full, and often hard pulse.

Of all the symptoms, the acute pungent pain is that which is most uniformly present ; it may of course exist in any part of the chest, according to the seat of the inflammation ; it for the most part gradually, but sometimes rapidly, increases in severity, and is occasionally observed

to shoot or radiate in various directions. It differs much in degree in different cases, being in general most severe in persons of vigorous constitution and of a tense or rigid fibre; whereas in old, relaxed, and leucophlegmatic subjects, it may be comparatively slight or even altogether absent. It is greatly increased by drawing in a deep inspiration, by the act of coughing, and not unfrequently, though not uniformly, by pressure made upon the intercostal spaces situated over the inflamed part. Its intensity is also very much influenced by the seat of the inflammation, and occasionally by the position of the patient. It is most severe when inflammation attacks the inferior and lateral, or the inferior and anterior parts of the chest, where the diaphragm is attached to the ribs; but is occasionally very inconsiderable when the upper part of the chest is affected. As regards the effect of position, it may be stated generally, that whatever position causes the most considerable elevation of the ribs, covered by the inflamed membrane, will occasion the greatest pain: and hence it is, that in pleurisy situated at the upper part of the chest, the patient will often lie indifferently on either side or upon his back; whilst if situated very low down, he will, in order to preserve the ribs in a state of repose, often prefer lying on the side affected, or even endeavour by pressure to prevent that movement of the ribs, which he soon discovers to be the chief cause of his suffering. The duration of the pain will necessarily vary with the promptitude and activity of the treatment. If proper remedies be early employed it will seldom last longer than two, three, or four days; and even when the case is neglected it will now and then subside and almost disappear in less than a week.

The dyspnœa varies in degree, according to the seve-

rity and seat of the inflammation; it varies in kind with the period of the disease. In the early stage of a severe attack, the dyspnœa is manifestly occasioned by the inability of the patient to expand his chest without aggravating the pain; whilst at a later period it arises chiefly or entirely from compression of the lung by serous and albuminous effusion. If at an early period the patient be desired to inspire deeply, he will, on making the attempt, suddenly come to a stop or check, attended with a sort of catch or sob, owing to the pungency of the pain, or stitch, produced by the effort. So long, therefore, as the pain continues thus severe, the respiration is short and hurried. We also find, as might be expected, that the dyspnœa at an early period is most considerable when the inflammation is so situated as to produce the greatest degree of pain; it is least considerable when inflammation is situated at the upper part of the chest; it is generally more severe the lower it extends; it is not observed to give rise to any very unusual distress when it attacks the base of the lungs and that portion of the diaphragm on which the base of the lung rests; but when it attacks the inferior and anterior or inferior and lateral regions where the diaphragm is attached to the ribs, the dyspnœa and pain often become excruciating, almost throw the patient into convulsions, and give rise to that distortion and expression of agony in the countenance, usually described as the *Risus Sardonius*, or Sardonius Grin.

At a later period of the disease, the dyspnœa arises chiefly or entirely from serous and albuminous effusion compressing the lung; it is then often unattended by the least pain; it is of course more or less urgent, according to the quantity of the effusion; and indeed when very abundant, the patient, on attempting to lie on the sound side,

often experiences a most distressing sense of suffocation, in consequence of the fluid gravitating towards the mediastinum, and thereby encroaching upon the lung of that side also. Whether occasioned by pain or by effusion, the dyspnœa varies much in degree in different cases; it is sometimes extremely slight; it is greater the more extensive the inflammation, and especially when both sides of the chest are affected at the same time; it is also much aggravated by accidental complications of phthisis, pneumonia, emphysema, and bronchitis.

The cough in simple pleurisy is extremely slight and often altogether wanting; when present, it is of necessity almost uniformly painful, and is either dry or attended only with a very scanty mucous expectoration occasionally streaked with blood, as if the whole came from the fauces; wherever, therefore, copious expectoration is present in pleurisy, we may be certain that it proceeds from an accidental complication of catarrh, bronchitis, or pneumonia.

Unless it occur in old people, or in persons of a bad or cachectic habit of body, the febrile symptoms which accompany acute pleurisy are of the purely inflammatory type; they are severe in proportion to the intensity and extent of the inflammation and to the phlogistic tendency of the patient's constitution; they seldom continue beyond a few days, provided the disease has been properly treated, and are rarely very urgent after the cessation of the pain. When, however, the effusion is considerable, and when the albuminous portion of it takes on the more purulent form, it often happens that sooner or later symptoms of hectic fever are observed to supervene.

It is only by a knowledge of the appearances observed on dissection that we are enabled to understand and appreciate the physical signs of pleurisy. At an early stage

of the disease, the inflamed pleura is found highly reddened by finely injected blood-vessels; this redness, though probably uniform before death, is now observed to be distributed in irregular patches of various sizes,—both the patches and the interstices between them presenting many minute specks or spots of ecchymosis. At a later period, we find serum and solid albumen effused into the pleural cavity in ever-varying proportions. The serum is commonly of a pale straw or citrine colour; it is frequently rendered turbid or milky by an admixture of minute grains or fragments of albumen, and is in rare cases found mixed with blood. The more massive part of the albumen is either spread over a greater or less extent of one or both pleuræ in a membranous, granular, or reticulated form, or it hangs in bridles or festoons stretching across from the pulmonary to the costal pleura. In some instances, especially when the patient is old or of a scrofulous or cachectic habit of body, the serum is found in great abundance, quite transparent, and of a citrine colour, whilst the solid albumen is extremely scanty, soft, and of a gelatinous aspect. In other cases we observe a thin membranous film of albumen spread over a certain extent of the inflamed surfaces, the greater part of the solid product being so intimately mixed with the serum as to impart a puriform character to the whole of the fluid effusion. When the effusion is very abundant, unless prevented by old pleuritic adhesions, we find the lung of the affected side forced against the mediastinum and spine, and to such an extent in some instances, as to be reduced to an almost incredibly small size. In proportion to the degree and continuance of this compression, we find the lung devoid of air, and presenting, when cut into, a dark red, flabby, and fleshy appearance. In some rare

cases, in consequence of inflammation having extended to the cellular membrane between the lobes of the lungs, we find an accumulation of pus in that situation; an appearance which has occasionally been mistaken for pneumonic abscess.

Physical signs.—In the first stage of pleurisy, previous to effusion, neither percussion nor auscultation furnishes the least indication of disease; external examination detects nothing, unless it be an immobility of the ribs of the affected side, and occasionally a diminution in the intensity of the respiratory murmur, owing to the imperfect manner in which the patient expands his chest. It has indeed been affirmed, that in consequence of a supposed dryness of the membrane at the very commencement, a rubbing of the two pleuræ against each other may now and then be heard during the ascent and descent of the ribs; but if so, we believe the opportunity of detecting it to be very rare. As soon, however, as effusion has taken place, auscultation never fails to recognise a feebleness of the respiratory murmur; we detect œgophony, and percussion elicits a remarkably dull sound. So long as the effusion does not amount to more than a thin sheet of serous fluid, we have simple œgophony; should the effusion consist of a thin layer of solid albumen with little or no fluid admixture, with dullness on percussion we have tubular respiration and a clear bronchophony; whereas if the effused matter without being considerable consists of a mixture of solid albumen and serum, auscultation detects tubular respiration, with that modification of œgophony which so closely resembles the croaking or squeaking voice of Punch. When the patient speaks, the hand, placed upon the ribs over the part affected, can often recognise at this time the absence of a certain vibratory

impulse, usually communicated to it in the natural state of the chest.

As the effusion increases, the dullness on percussion becomes complete ; the respiratory murmur gets gradually more and more distant and indistinct, and at length is no longer audible. The tubular respiration, and that modification of *œgophony* which resembles Punch's voice, may continue to be heard for some time after all respiratory murmur has ceased ; these also are gradually lost as the effusion proceeds, although in many instances tubular respiration and the concentration of the voice called *bronchophony*, can be distinctly recognised, not only long after all respiratory murmur has been obliterated, but even when the effusion is known to be very considerable ; under such circumstances, however, we have a perfect consciousness that both these sounds proceed from a distant part in the interior of the chest. Supposing the effusion to go on increasing in quantity, the lung is at length compressed into a small space against the spine, so that we no longer discover any trace of respiratory murmur except over a small space between the scapulæ ; the intercostal spaces are elevated to the level of the ribs, or project beyond them ; the ribs themselves protrude, occasioning a perceptible enlargement of the chest ; and in extreme cases the effused fluid actually forces down the diaphragm and liver if on the right, or displaces the heart and spleen if on the left side. The order of the physical signs therefore are, more or less immobility of the ribs of the affected side, and consequent feebleness of the respiratory murmur in the first stage ; diminished vibration of the patient's voice as felt by applying the hand to the ribs situated over the affected part, dullness of sound on percussion, gradual cessation of respiratory murmur,

œgophony or bronchophony, and tubular respiration in the second stage, or when effusion has taken place only to a limited extent; and, lastly, total obliteration of respiratory murmur, except between the scapulæ, distant bronchophony and tubular respiration, protrusion of the intercostal spaces and afterwards of the ribs themselves, with displacement of the liver on the right, and of the heart and spleen on the left side.

Effects or terminations of Pleurisy.—Pleurisy is said occasionally to terminate in resolution, that is, never to have passed beyond the first or dry stage; of this, however, it is difficult to obtain any positive evidence; and from the great proneness of serous membranes under inflammation to pour out serum and albumen, it is very improbable that pleurisy ever terminates without more or less effusion having taken place. Unquestionably its most frequent termination is in effusion succeeded by adhesion; the serum is gradually absorbed, the pleuræ approach each other, and become united through the medium of the albumen thrown out upon one or both of them. The rapidity with which these changes take place will depend much upon the quantity of the serum and the character of the albumen. When the quantity of serum is moderate, and when the albumen is of the more plastic or organizable kind, as usually happens in good constitutions, the process will be comparatively rapid; whereas, if the serum be abundant and the albumen less plastic, it will be proportionably slower; and indeed when the effusion takes on the puriform character, the reparatory process may not take place at all; instead of which, the puriform deposit remains permanently, constituting what has been called *chronic empyema*, so called to distinguish it from the abundant and extremely oppressive

effusion which sometimes occurs very early, and which on that account has been called *acute empyema*.

When the effused albumen is susceptible of organization, blood-vessels sooner or later form in it, and it is gradually converted either into cellular tissue which binds the pleuræ together, or into an adventitious coating spread over one or both pleuræ, and which takes on all the ordinary functions of a serous membrane. As the organization of these new structures proceeds, they contract, and by their contraction induce various mechanical changes in the adjacent parts. When confined to the pulmonary pleura, they are found at an after period of various degrees of thickness, and rendering that membrane more or less opaque, whilst the lung itself so situated is manifestly encroached upon, as shown by its rounded edges or actual diminution in size. The effects, however, of the contraction of these new tissues are most striking when the effusion has been very considerable, together with a copious deposit of plastic albumen upon the whole of the surrounding pleuræ. Under these circumstances, as the serum is absorbed and the albumen proceeds to organization, the contraction is often such as to draw the ribs into close approximation, to depress the shoulder, to diminish the size and alter the form of the affected side of the chest, and even to bend the spine, the lung probably being at the same time permanently bound down against the mediastinum and superior dorsal vertebræ. It is under these circumstances, also, that the diaphragm is occasionally drawn up considerably above its natural level in consequence of adhesions forming between the diaphragmatic pleura, and that covering the base of the lungs. Should a patient survive for some time who has had a pleurisy attended with copious effusion and a large proportion of plastic albumen,

we occasionally find on examining the body at an after period that the adventitious structure formed on each pleura is of considerable thickness, that it has acquired a remarkable degree of density, and that the two layers have either come in contact and united through the medium of a tissue differing somewhat in appearance from either of them; or we perhaps discover, although many months after the attack, a small circumscribed space where union has not taken place, and which is still occupied by a fluid.

Some of these permanent effects of pleurisy are distinctly discoverable years after the attack which produced them, even when the deformity is not such as to strike the eye of the observer. In such cases there remains permanently some degree of dullness on percussion, and the respiratory murmur presents various degrees of imperfection, being in some instances merely very feeble, in others tubular, and in others feeble and blended with a dry croaking sound.

As already observed, when the effusion is considerable, and when the albumen assumes a puriform character, as often happens in scrofulous habits, the changes described do not take place; instead of which, the effused matters are neither absorbed nor become organized; they remain more or less stationary, and thereby constitute

EMPYEMA.

This empyema is now and then attended with so little local disturbance as to escape detection altogether, and especially so when it occurs in infants and children. In such young subjects we have occasionally been led to suspect its existence by the remarkable paleness of the

face, and bloodless aspect of the eyes of the child, further inquiry eliciting from the attendants proofs of some previous indisposition, but probably several weeks before, and without its having been referred to the chest in particular. In the cases referred to, auscultation and percussion, and in two instances paracestecis thoracis, placed the matter beyond the possibility of a doubt. The same oversight has occurred and been detected in like manner in the adult, although with his perfect knowledge of having suffered pain in the side and shortness of breath weeks or months before. He probably complains only of general languor, some loss of flesh or strength, transitory flushes of heat, occasional sweats during the night, and slight hurry of respiration on making exertion. In most instances, however, the transition from pleurisy to empyema is sufficiently obvious, the disease quickly giving rise to well-marked symptoms of hectic fever, which, unless relieved by nature or art, gradually lead to emaciation, exhaustion, and death.

In some rare instances, the matter contained within the chest has caused ulceration of the pleura costalis, has pointed and burst externally, and the patient has ultimately recovered. More frequently, it excites ulceration in the pulmonary pleura, passes into the lungs, and is expectorated through the bronchial tubes; the communication thus formed between the bronchial and pleural cavity giving rise at the same time to pneumothorax. When this event takes place, the patient perhaps experiences a sudden pain or uneasiness within the chest, with oppression of the breath or sense of suffocation and cough, and presently afterwards expectorates pus, sometimes in small quantity at first, but often so exceedingly copious, that he seems to vomit rather than expectorate it. The

puriform fluid discharged in this way presents pretty uniformly the same appearances: it consists of irregular opaque masses or lumps of a yellow or greenish yellow colour, floating in a thin and turbid serum. These discharges usually recur at uncertain periods, and vary in quantity from a table-spoonful to half a pint or more; the patient in the intervals either not expectorating at all, or merely rejecting some bronchial mucus, mixed perhaps with small portions of the pleural secretion.

The result of empyema communicating with the lungs is various; in some instances the distress of breathing and constitutional irritation are such as to prove speedily fatal; but in the majority of cases, the patient rallies from the first shock, and either gradually and slowly recovers, or continues to suffer from hectic fever, and ultimately dies, as if from phthisis pulmonalis, for which it has often been mistaken. A person, however, has continued for years to reject from the lungs, once or twice a day, a large quantity of extremely foetid pus derived from empyema.

If we have an opportunity of examining the chest of a person who has recovered from an empyema which has been evacuated through the lung, we commonly find the organ reduced to an extremely small size, firmly bound down by false membranes, and its internal structure converted into a dense and almost cartilaginous cellular tissue, including within it the remains of the larger bronchi; whilst at the same time, we either have the two pleuræ closely and inseparably adherent everywhere; or discover at some part, a small space remaining ununited, and communicating by smooth and polished orifices with the bronchi, through which the matter of the empyema had passed.

Diagnosis of Pleurisy.—When investigating the physical signs in a case of real or suspected pleurisy, it must

be carefully borne in mind, that dullness of sound on percussion, and feebleness or entire obliteration of respiratory murmur, may exist independently of any recent disease whatever; these morbid indications being the result of a previous attack of the complaint. Pleurisy is to be distinguished from pneumonia by the acute pungent pain, and by the absence of the pungent heat, the cough and peculiar expectoration, and the crepitating rattle so characteristic of the latter. When pleurisy has advanced to its second stage, it is sometimes more difficult to determine whether the dullness of sound, the bronchophony, and bronchial respiration, often present, arise from pleuritic effusion or from pneumonia advanced to hepatization. In pleurisy, these signs are usually preceded by acute pain, which is not the case in simple pneumonia; in pleurisy the dullness of sound takes place more suddenly and over a much larger extent of surface than in pneumonia; in pleurisy the bronchophony is generally mixed with one of the modifications of ægophony; in pleurisy there is very seldom any cough or expectoration unless complicated with bronchitis, and never the peculiar sputa observed in pneumonia. It would appear, that when a thin layer of solid albumen, with little or no fluid, overspreads the pleura, the bronchophony is so clear and unmixed with ægophony that it may lead to a belief in the existence of pneumonia advanced to hepatization; but the previous pain, the suddenness and great extent of the dullness on percussion, and the absence of cough and peculiar expectoration, will seldom fail sufficiently to declare the nature of the case. It is right to observe, however, that the two diseases are frequently combined, and then we have the signs of both more or less strongly marked.

From bronchitis, pleurisy is to be distinguished by the

signs and symptoms already enumerated as characteristic of the latter, and by the absence of the violent cough, copious expectoration, and the several rattles peculiar to the former. When the two diseases are combined, their respective signs and symptoms present a corresponding complication.

In the first stage of pleurisy, it is sometimes difficult to determine whether the acute pain in the side may not arise from pleurodynia or rheumatism affecting the parietes of the chest, as in neither case have we any indication furnished by auscultation or by percussion, and as in both there is pain on inspiration, with more or less immobility of the ribs. * In pleurodynia, the pain is more uniformly increased by pressure or motion, and we occasionally observe at the same time, rheumatic symptoms in other parts of the body; or perhaps learn that the patient has been subject to them at a former period. It does not often happen, however, that we are called so early to a case of pleurisy as to discover no indication of effusion; and when this has decidedly occurred, the distinction of the two diseases will be sufficiently obvious.

There are probably no two morbid affections more frequently confounded with each other than pleurisy and hysterical neuralgia, and there is certainly no mistake in diagnosis which has led to more injurious practice. The diagnosis is often difficult, especially to those who neglect auscultation and percussion; and it must be confessed that with every advantage it occasionally continues for some time to be doubtful. In neuralgia there is generally little or no febrile excitement; it is met with most frequently or perhaps exclusively in females; the pain is pretty uniformly felt either under the left mamma or near the margins of the ribs on the right side; the patient almost

always suffers from irregular or painful menstruation, and will very commonly be found on inquiry to have experienced a similar pain, or some manifestly hysterical symptoms, before. A very short time will suffice to remove all doubt, as effusion will take place if the case be one of pleurisy, and consequently the ordinary physical signs will be developed ;—hence, if the pain have existed some days prior to our visit, and neither auscultation nor percussion yield any signs of pleurisy, we may be nearly certain that the case is one of mere neuralgia.

Pleurisy of the lower part of the right side has been mistaken for acute hepatitis. It is to be distinguished by the physical signs peculiar to the former ; and by the absence of sickness, the icteritious aspect of the countenance, and the pain in the right shoulder so commonly present in the latter. It must however be remembered, that pleurisy affecting the surface of the diaphragm has also been attended with an acute pain extending to the right shoulder ; but the diagnosis is of comparatively little consequence, as the treatment is nearly the same in both diseases.

When pleurisy attacks the lower part of the chest, and effusion takes place into the acute angle formed by the diaphragm and ribs, it would appear as if the lung were occasionally prevented from descending into that narrow space, and consequently that *œgophony*, *bronchophony*, and bronchial respiration fail to be heard. It is of importance to remember this, as the absence of these signs is calculated to mislead us in our diagnosis on whichever side of the chest it may occur. If on the right side, the dullness of sound on percussion may be referred to the liver ; whereas if on the left, the flatulent colon and stomach may afford such a degree of resonance, even after

effusion has taken place, that we may regard it as natural. In one obscure case of this kind affecting the left side, pleurisy with albuminous effusion was prognosticated from a distinct perception of crepitation during each inspiration, on applying the flat hand over the seat of pain.

Prognosis of Pleurisy.—The prognosis is to be drawn from a consideration of the patient's age and constitution, from the extent and severity of the attack, from the degree of effusion, from its being simple or complicated with other diseases, and from the purely inflammatory or typhoid type of the accompanying fever. Slight cases of pleurisy in moderately good constitutions are so far from being attended with danger, that in this climate we rarely inspect the body of a person advanced in life without finding traces of adhesion between the pleuræ, or some other indication of previous pleurisy. When, however, the disease is severe and extensive, when it attacks both sides of the chest at the same time, when it has been neglected in the first instance, when the effusion is rapid and considerable, when the disease occurs in persons of a bad, cachectic, or dropsical habit, or when it supervenes in the progress of some other severe disorder, we cannot but entertain considerable apprehension. As regards the immediate safety of the patient in any individual case, the favourable indications are, a subsidence of the pain and fever, with a corresponding relief to the breathing, and without signs of considerable or increasing effusion. The unfavourable indications are, a continuance and aggravation of the pain with extreme difficulty of breathing, the risus sardonicus, great rapidity and diminishing strength in the pulse, and abundant and increasing effusion. The prospect of a complete recovery will depend very much upon the state of the patient's constitution and the con-

sequent quantity and character of the effusion; for it is chiefly in patients of a scrofulous or cachectic habit of body, that we have the effusion at once copious and of a puriform character:—hence it is, that in such constitutions the disease is apt to pass into a chronic state, constituting empyema;—and hence it is, that paracentesis thoracis when urgently required, so seldom proves successful in ultimately saving the patient's life. When pleurisy is complicated with another disease, the danger will of course be increased in proportion to the nature and severity of the complication.

Causes of Pleurisy.—Certain individuals manifest a predisposition to the complaint, concerning the nature of which we are altogether ignorant. A predisposition is occasionally observable in persons of a plethoric habit, and in those who possess an unusually irritable condition of the vascular system. It is most common during the adult and middle periods of life, although by no means unfrequent in infants and children, in whom it is often altogether overlooked. It prevails most in winter and spring, and more frequently attacks males than females; probably, from the latter being less subjected to the more violent exciting causes, from the habit of exposure rendering their chest less susceptible, and partly, perhaps, from the mammæ proving a protection to the interior. There occasionally prevails an epidemic state of the atmosphere which either induces the disease originally, or causes it to be developed in the progress of other disorders. Of the *exciting* causes, the most frequent is exposure to cold and damp, especially when the body is perspiring or in a state of exhaustion or fatigue. It may be induced by bruises or falls, and especially if such violence have the effect of fracturing a rib; it appears

not unfrequently to be a consequence of fistula in ano, or other cause of suppuration deep-seated in the pelvis; and in common with inflammation of other serous membranes, it repeatedly occurs in connexion with diseased kidneys. It often supervenes upon continued, remittent, and intermittent fevers, measles, smallpox, catarrh, hooping-cough, and phthisis, and it is said to have occurred in connexion with repelled eruptions, with the suppression of habitual discharges, and with a metastasis of gout, rheumatism, or erysipelas.

Treatment of Pleurisy.—The treatment of acute pleurisy is extremely simple; the most successful practice consisting in active depletion and a free use of mercury, so as to produce its specific effects upon the system. The patient should be bled from a large orifice, to an amount proportionate to his age and constitution, the degree of febrile excitement present, and the severity of the inflammation; but carried perhaps in every instance to the extent of inducing a state approaching to syncope. Should the patient therefore be delicate or of bad habit of body, we may endeavour to accelerate this state by placing him in an upright position. Immediately after such a bleeding, two, three, or four grains of calomel, with a grain of opium and a quarter of a grain of tartar emetic, may be given, and repeated every four, five, or six hours. Should the general excitement, or the local pain and difficulty of breathing indicate its propriety, the bleeding may be repeated once or oftener, according to the circumstances of the case. When further general depletion becomes questionable, local bleeding by means of cupping will be found an excellent substitute; after which, a poultice or hot fomentation may be applied, or at a still later period, a blister or mustard poultice, either of which

may be repeated as often as necessary. In milder cases, local depletion and blistering, or the latter alone, may be sufficient, in addition to a reduced quantity of the internal remedies. The bowels may be kept gently open, by the occasional use of senna and salts, or castor oil; and the patient should be confined to bed and put upon the use of slops. As soon as the mouth is affected by the mercury, it may either be withdrawn altogether, or given only every night, or every night and morning in smaller doses, so as to maintain a gentle mercurial action for some time. This will be more desirable in proportion as the effusion has been considerable before professional assistance has been sought. When pleurisy occurs in the aged or in bad and cachectic constitutions, we must be more sparing of general blood-letting, substituting for it local bleeding and blistering, together with a more moderate use of calomel. A grain or two of this, with a grain of opium, but perhaps without antimony, twice or thrice a day, will in general be sufficient. In such cases, too, a more liberal allowance of bland nourishing diet may be required, especially if the individual have been of intemperate habits; indeed in the latter case, depletion of any kind ought to be adopted with great caution; good nourishment should be given early, and afterwards tonics and the milder stimulants, such as serpentary and ammonia. In some instances, wine, or even gin or brandy, will be required, especially if symptoms of delirium tremens happen to supervene.

Treatment of Empyema.—When the fever and local inflammation have been subdued by proper remedies, the complete recovery of the patient will be rapid in proportion to the extent and character of the effusion. When the effusion is inconsiderable in quantity and contains a

large proportion of plastic albumen, we commonly find that the serum is speedily absorbed, and that the albumen presently takes on organization, without any material disturbance of the general constitution, and without requiring any particular interference. But when the effusion is of a less healthy kind, when the serum is copious and the albumen of a more puriform character, a much longer period elapses before the pleuræ or their respective deposits come in contact and adhere together. In this case, the patient lingers a variable period, becoming pale, perhaps losing flesh, and occasionally experiencing obscure symptoms of hectic fever. Under these circumstances, attempts may be made to promote absorption by means of repeated blisters or other counter-irritants, mild mercurials, and diuretics, such as nitre, acetate of potash, spt. æth. nitric., and digitalis; endeavouring at the same time to obviate internal sources of irritation and procure repose by means of gentle laxatives and opiates; and supporting the strength by a bland nourishing diet. When the effusion is so abundant as greatly to oppress the breathing, and perhaps also to enlarge the chest, it may then be regarded as constituting a more decided empyema; a morbid condition, nevertheless, which, so far as the general and ordinary local remedies are concerned, must be treated precisely in the same manner as that just described.

Paracentesis Thoracis.

When acute empyema causes extreme oppression of the breathing, or when in its more chronic form, there is not only considerable dyspnœa, but indications that the powers of the system are unequal to the removal of the effusion, it has been proposed to perform the operation of para-

centesis thoracis. This is an operation of easy performance, of little or no danger in itself, and one which has often been followed by a complete recovery of the patient; with the exception, perhaps, of a certain degree of deformity or distortion occasioned by the contraction of the adventitious membranes. When performed at an early period, and before the lung has been bound down by adhesions, or, when the effusion consists chiefly of serum, there will be a fair prospect of success, provided the patient be of a moderately good constitution; but unfortunately, it is chiefly in scrofulous and cachectic habits that the effusion is so considerable and of such a character as to require the operation; and as in such subjects there is always a strong tendency to a repetition of the same abundant and unhealthy secretion after its performance, the prognosis is in most instances unfavourable. Unless, therefore, the distress of breathing or the degree of constitutional irritation strongly indicate its necessity, it is better to abstain from operating; since, for the reasons assigned, it will rarely succeed when urgently required, and is seldom required when success appears probable.

Previous to determining upon the operation, every precaution must be taken, to avoid error, to be convinced of the actual presence of the effusion, and to be quite certain that the distress of the patient does not arise from some other cause. Should repeated examination of the physical signs, the protrusion of the ribs, and the displacement of organs, leave no doubt on this matter, all that is further requisite is to ascertain positively from the dullness on percussion, and the distant bronchophony and tubular respiration, that there exists no adhesion between the pleuræ at the part where we intend to operate. Unless some

degree of fluctuation can be felt elsewhere, or unless contra-indicated by other circumstances, it is perhaps preferable to perforate the parietes of the chest a little *below* the middle of an intercostal space between the seventh and eighth, or eighth and ninth ribs, and about three or four inches distant from the spine, so as to avoid the intervening layer of muscles. As a matter of precaution, it has been recommended to introduce in the first instance, a grooved needle, in order to ascertain positively the presence, as well as the character, of the effusion. This exploration, when properly executed, will indeed determine the presence or absence of the effusion, but is by no means so decisive as to its character; for we have known as much as half a pint of nearly colourless serum escape in this way, to be followed, on the introduction of a canula, by nearly a gallon of thick puriform matter. It must also be remembered, that from the small size of the needle, the narrowness of its groove, and the elasticity of the integuments, the fluid when present, may fail to flow, unless some art is employed in turning it round in various directions for some time. Having ascertained in this way, the presence of effusion, the needle may be withdrawn, a small incision made through the integuments by means of a scalpel, and a trocar introduced. Should the canula become obstructed, a blunt-pointed probe may be passed through it into the cavity of the pleura. The quantity to be drawn off must be determined by the discretion of the practitioner and the relief afforded the patient; after which, the wound may either be closed, or a plugged canula or piece of warm catheter may be left secured in the wound, to be opened from time to time as circumstances may require.

Chronic Pleurisy.

When the effects of acute pleurisy remain for some time in consequence of the quantity or quality of the effusion, or when it terminates in empyema, the disease may be said to have become chronic; but in many instances pleurisy assumes a chronic character from the very commencement. Such cases most frequently occur in persons of advanced life, of bad or cachectic habit of body, and especially in leucophlegmatic-looking subjects with diseased kidneys.

The disorder under these circumstances, is never attended with much febrile excitement or other constitutional disturbance; there is probably a general feeling of indisposition, slight indications of irregular hectic, more or less dyspnœa especially on exertion, and slight cough. As the effusion increases, however, the breathing becomes more and more oppressed, and first auscultation and percussion, and afterwards actual protrusion of the intercostal spaces or ribs, sufficiently declare the existence, as well as the extent of the effusion. On dissection, we find the effusion to consist chiefly of serum, sometimes rendered turbid by an admixture of albumen in a granular or flaky form, sometimes though rarely mixed with blood, but in the majority of cases almost transparent and of a greenish or citrine colour. The solid albumen is usually in very small quantity, generally forming a thin soft membrane overspreading a greater or less portion of one of the pleuræ, or, now and then, feebly uniting the two pleuræ together at certain points. In other cases, we have a great abundance of citrine-coloured serum with no detached albuminous matter whatever, whilst the pleuræ appear thickened and opaque in consequence of the formation over

them of a thin, smooth, adventitious coating, which has taken on all the ordinary functions of a serous membrane. Under these circumstances the lungs are often more or less pinched up and have their edges rounded by the contraction which uniformly attends the organization of all such albuminous deposits. In a few instances, the pleuræ have been found studded with tubercles.

The *treatment* in chronic pleurisy must of course be very gentle, and consist chiefly of very moderate local depletion, blistering, or other forms of counter-irritation, mild mercurials, in combination with anodynes and diaphoretics; and afterwards, diuretics, tonics, and nourishing diet. Should the effusion be so abundant as greatly to oppress the breathing, paracentesis thoracis may be had recourse to with safety and occasionally with success; the lungs readily recovering their power of expansion in consequence of the small extent or total absence of adhesions in such cases.

PHTHISIS PULMONALIS.

Phthisis is a Greek word, signifying corruption or consumption, and as applied to the present disease, it must be considered as indicating one mode in which a certain morbid state of the constitution manifests itself. That state may be called the *tuberculous* condition or diathesis, and approaches very near to, if it be not identical with, the *scrofulous* diathesis.

The symptoms of phthisis pulmonalis are liable to great variation; but the most characteristic are, cough, with some peculiar modifications of the expectoration, accompanied by general emaciation, gradually increasing dyspnoea and debility, with hectic fever. To these must be

added certain indications afforded by percussion and auscultation, dullness on percussion over the affected part of the lungs, respiration imperfect or inaudible in some parts, puerile or crepitant in others, and as the disease advances attended with mucous and gurgling rattles, and bronchial or cavernous respiration, bronchophony, and pectriloquy.

The history and progress of phthisis vary with regard to all the symptoms. It is in some cases an acute, in others a chronic disease. It may run its whole course in a month or six weeks, or it may continue for many years.

The tuberculous constitution.—Before entering particularly and technically into the history of phthisis, a few words may be said respecting that condition of the system upon which it appears greatly to depend, and without which, acting as a predisposing cause, it is even doubtful whether the disease ever arises. This condition has been denominated the tuberculous diathesis,—a name derived from the tendency which is evinced under its influence to the deposit of a peculiar matter in various organs and tissues of the body, forming irregular masses of greater or less extent, of a more or less opake, yellow, or white matter, at first hard, but gradually softening down into a state approaching suppuration and yielding an unhealthy curd-like pus. The peculiar condition of the body, of which this tendency to tubercular deposit is one marked feature, is most widely diffused; and as it is most decidedly a state which is propagated from generation to generation, passing from parents to children, it is not difficult to understand how the intermarriages of families may spread the morbid tendency more and more generally abroad; but besides this there is little reason to doubt that it is capable of being generated *de novo*, or, what is nearly equivalent, that the slightest sparks of the disease,

hidden and unperceived for generations, may be fanned into a flame by the exposures and the excesses of the rich and the luxurious, or may be nurtured into a smouldering but no less consuming fire by the privations and irregularities to which poverty is subject. The signs of this tuberculous constitution are often discoverable at the earliest periods of life, frequently develop themselves strongly within the first years in the form of actual disease, and still more often are indelibly fixed in the whole constitution, form, and appearance, whether circumstances combine to call forth the more diseased manifestations of its existence, or the individual remain through life in the enjoyment of uninterrupted health.

There are two conditions of outward appearance which belong peculiarly to the tuberculous constitution, and so different are they, that nothing but the fact of their frequent association with tubercular disease would lead us to consider them as marks of a similar condition of the body. In the one we find what may truly be called the sanguineous temperament, the fair complexion, light hair and eyelashes, blue eyes, slender form, long fingers and contracted nails, fine white and regular teeth; or in the male, the ruddy complexion, with the hair and whiskers inclining to red, and with these associated a peculiar liveliness, activity, and susceptibility of mind. In the other we have the dark and swarthy complexion, or perhaps the opaque white skin, with black eyes, long dark eyelashes, dark hair, the thick upper lip, and often a more sturdy form, short fingers, and nails wide and large, with the slower intellect and less energetic disposition. In the individuals of both these classes we find that disease is apt to run on and to become marked by peculiar symptoms of irritability, which after a time we discover to

depend on slower or more rapid changes in the glandular system, and in the membranes both mucous and serous. We find the digestive organs easily deranged, the process of assimilation performed imperfectly, even when actual disease has not yet developed itself; and in nothing does the general susceptibility to impressions show itself more remarkably than in the readiness with which the bronchial tubes and the air-passages become affected with inflammation, producing repeated colds and protracted coughs.

It is then in persons of these temperaments and of this condition that phthisis pulmonalis generally manifests itself, and it is of the utmost importance to bear this in mind, as it will lead us to view the disease in its constitutional rather than its local bearings, inducing us, as far as possible, to anticipate and prevent the disease, or meet it in its first approaches rather than await its complete establishment, when unfortunately our best means will generally prove but palliative, serving only to prolong life a little, and render the progressive stages of a fatal disease less irksome and less oppressive.

History.—As may well be expected from the different circumstances under which this disease appears, the history of its progress is subject to very great varieties; but the symptoms of its approach are frequently so insidious, as to escape for a time the most anxious observation. A slight cough, almost without expectoration, is the first specific symptom which is added to the general indications of a somewhat delicate constitution. At first this is scarcely sufficient to excite remark; by degrees, however, it increases and becomes troublesome, especially when the patient wakes in the morning, while the expectoration is more decided, but so purely mucous in its character as to allay suspicion for a time. The cough continues, the

glairy mucus is changed for a more opaque secretion, one or two scarcely perceptible streaks of blood are occasionally seen in the sputa, but easily ascribed to the bleeding of the nose, the gums, or the throat. The pulse, which is tranquil before rising in the morning, is accelerated as the day advances. Now the breathing is discovered to be shorter than usual, a quick walk or the exertion of ascending the stairs becomes irksome; the body perceptibly emaciates; the pulse ranges permanently from 90 to 100 and 120; the respirations approach to 30 in the minute, and pains more or less transient are experienced in various parts of the chest; the appetite becomes capricious; if the patient be a female, the catamenia are gradually diminished and cease altogether; morning and evening exacerbations of hectic fever, with shivering, dry heat, and perspiration, supervene; the expectoration becomes profuse, consisting of clots of mingled mucus and pus; at intervals of some days or weeks a little blood may show itself, and occasionally amounts to more decided hæmoptysis; the voice becomes weak, or hoarseness of a more fixed or a more transient character occurs. The fits of coughing are sometimes severe, and if they come on after a meal are frequently followed by the rejection of the food. The nights are disturbed, sometimes by cough, sometimes by burning heats, and towards the morning by profuse perspirations. The bowels are irregular, sometimes confined, at others greatly purged; the tongue being generally loaded at its root, or bespeaking by the redness of the tip and edges the irritable condition of the intestinal canal. Thus gradually proceeding, and so slowly advancing that it is only by comparing the condition of the patient with his state a week or a month before, we can discover the decided progress which the disease has made,

the powers of life are at length so completely exhausted, that the patient, whose fauces have become aphthous, whose legs are œdematous, and whose mind has begun to falter, turns in his bed and dies without a struggle; or at other times, the dyspnœa becoming most distressing, the purple countenance and clammy perspiration bespeak the slow process of suffocation under which he is sinking; or not unfrequently a sudden gush of blood is thrown into the mouth, then drawn down by inspiration into the air-passages, and death takes place almost instantaneously. Looking back to the first appreciable symptoms of such a case, the period of a year or eighteen months may be ascribed to the whole course of the disease.

Another form which the disease assumes is much more speedy, while other cases again are slower in their progress. It will occasionally happen that a man having all the marks of robust health about him, but having a body prone by birth to tubercular mischief, and probably having his vascular system deranged by a life of intemperate excitement, becomes the subject of severe catarrh or of a latent or subacute form of pneumonia. The active means or the strict precautions which such attacks require having been neglected, the cough which attended the first disease is never completely lost, but after a slight amendment rapidly increases, the expectoration is copious and purulent, the tongue is loaded, the pulse accelerated, hectic quickly rages, the dyspnœa becomes alarming, and within ten or twelve weeks, or even less, he sinks into the grave. On the other hand we frequently meet with cases where individuals who have had all the symptoms of phthisis in their youth, and have been repeatedly subject to returns, in whom the emaciation, the characteristic expectoration, and the dyspnœa have all been present, and in whom, in

addition to the constitutional symptoms, there is reason to believe that the most unequivocal indications, as derived from percussion and the stethoscope, have existed, have yet gone on from year to year to an almost indefinite period ; and it would not perhaps be too much to ascribe to some such cases a duration of at least ten, twenty, or a still greater number of years. A few cases there are, likewise, in which the disease has terminated after a longer or shorter period in complete recovery.

It would appear that neither age nor sex affords any immunity from this disease ; children sink under it in the first weeks of life, as well as persons in advanced years ; but probably the range of its most frequent occurrence may be placed between the ages of fifteen and forty ; and so great is its prevalence that it has been variously computed in different countries and situations that one fourth or one sixth of the whole population is cut off by its ravages.

Morbid changes.—Previously to making a few remarks upon the individual symptoms, and particularly upon those indications which are derived in this disease from the stethoscope, it may be well to put the student in possession of the morbid appearances which present themselves on dissection, as he will thus be enabled to perceive the immediate connexion which exists between many of the symptoms and the appreciable structural alterations. The appearances to which our attention is naturally first directed are those which affect the lungs. The *tubercle* in its various forms, and in the different stages of its progress, is the specific mark of phthisis pulmonalis. In what precise structure this morbid deposit takes place, or whether its origin is confined to any particular structure in the lung, remains undecided ; but the universality of the oc-

currence of tubercles in the various organs and membranes of the body, renders it probable that the vessels of different structures are capable of assuming the altered action upon which their formation depends. The tubercle often commences as a small hard semitransparent body, not larger than the head of a pin, more or less generally disseminated through the lungs, and in that state it is scarcely perceptible to the eye, but may be plainly felt when a portion of the lung is pressed between the finger and the thumb. These little bodies enlarge and become opaque, gradually assuming a white or yellow colour chiefly towards their centre, where they soften and pass into a state resembling suppuration; but more frequently the small miliary tubercles congregate together in clusters, and softening in different centres form a cavity of considerable size, or running together suppurate and leave a small included mass of comparatively healthy lung, which sooner or later becomes insulated and sloughs; the softening proceeds, while at the same time fresh tubercular deposit accumulates around the circumference; and in this way the softening and the deposition go on till some small bronchial tube is ulcerated through, and thus a ready egress is afforded to the pus. At other times we find masses of grey semitransparent deposit of much greater extent in which suppuration has taken place in various parts forming cavities, which in like manner ultimately communicate with the bronchial tubes and discharge themselves. This latter appearance more frequently follows after inflammatory action has been excited in the lungs, and the situation of the tubercular disease is then determined by the seat of the previous inflammation; but when pneumonia has not preceded, the tubercle generally develops itself first at the apex of one of the lungs, and the left lung is found

upon the whole more frequently affected ; and if the loss of substance or the consolidation of the lung in that part be great, the external form of the chest becomes changed, the upper ribs appear flattened, and the natural rotundity of that portion of the chest is evidently diminished when compared with the opposite side. The cavities thus formed in the lung, and to which the name of vomicae has been given, vary much in their dimensions, being sometimes not larger than peas, while at other times they might contain several ounces of fluid. They are sometimes surrounded by firm parietes, almost cartilaginous, and are frequently intercepted by bands and bridles, the remnants of blood-vessels, and occasionally of bronchial tubes. The contents of the cavity are sometimes a curdled pus mingled with mucus, at other times a sloughy matter composed of disintegrated portions of the lung itself, and sometimes clots of blood are mingled with the other contents ; while from time to time an earthy or chalk-like matter consisting chiefly of phosphate of lime is found, and then there is usually some evidence that the cavity has been gradually contracting under a slow curative process. These cavities are sometimes deep-seated in the substance of the lung, at others they approach towards the surface so as to be bounded only by the pleura, in which case inflammation is often excited in that membrane, and adhesions are formed ; but should this not be the case, the pus sometimes finds its way into the cavity of the chest, and a quantity of air rushing through the opening gives rise to pneumothorax and sudden compression of the lung. When adhesion has formed between the pleura covering the lung and the pleura costalis, if the ulcerative process still continues, a communication is sometimes formed with the cellular membrane behind the

pleura, and on some sudden fit of coughing the air escaping diffuses itself through the cellular tissue, and an extensive emphysema is developed over the whole trunk.

In some of the most rapidly fatal cases of phthisis it has happened that the tubercles have never advanced to the state of softening, but have remained in the form of small hard miliary bodies closely occupying a very large proportion of the lung; under which circumstances the constant irritating cough and dyspnœa have never been accompanied by any of the characteristic forms of expectoration.

The *bronchial tubes* in phthisical lungs are usually inflamed and thickened; but this is more particularly observable near to the tubercular cavities when they are discharging themselves, so that they often assume the brightest vermilion tinge where they open into the cavity. Occasionally the bronchial tubes are gorged with blood, and when a transverse section of the lung is made, even in its more healthy parts, it presents a mottled and spotted appearance from the blood contained both in the bronchi and in the neighbouring air-cells. This, however, only occurs when death has been suddenly produced by suffocation in consequence of hæmorrhage.

The *larynx* and *trachea* frequently show marks of disease; vascularity in various degrees, together with abrasion and ulceration, which in many cases appear to depend upon a previous deposit of tuberculous matter. The ulceration most frequently takes place immediately below the rima glottidis, beginning by one or two small ulcers which extend, becoming irregular in form and assuming the appearance of superficial abrasion. Sometimes the epiglottis itself is ulcerated, and occasionally small separate ulcers are seen in the mucous membrane

of the trachea two or three inches below the cartilages of the larynx.

The *bronchial glands* are often enlarged, loaded with black matter or softened, and occasionally contain chalk-like concretions. The *pleura* is likewise very generally marked by traces of inflammatory action, and firm adhesions often exist near those parts where the tubercles are most advanced.

In the *abdomen* we almost always meet with some evidence of the constitutional nature of the disease; the absorbent glands enlarged, and in various stages of tubercular change, while the absorbent vessels are occasionally obstructed and filled sometimes with chyle, which they are unable to transmit, at other times they are filled with an apparently puriform fluid. In the internal coat of the intestines we detect ulceration to a greater or less extent, the result of the deposit of tuberculous matter beneath the villous membrane, and not confined to any particular portion of the canal, but attacking every part from the commencement of the duodenum to the termination of the rectum, more especially, however, the lower part of the ileum and the cæcum, where it occasionally commits most formidable ravages. When from any cause inflammatory action has been excited in the peritoneum, and the different forms of albuminous effusion have taken place, the newly formed membranes often become in a very few weeks the seat of numerous tubercles, serving still further to glue the viscera together in one complicated mass.

The *stomach* is frequently observed to be seriously affected; its dimensions enlarged, its internal coat thickened, mammillated, softened, or rendered hard. The liver occasionally undergoes change, sometimes suffering

the fatty degeneration, and, together with the spleen and kidneys, is now and then the seat of tubercular deposits.

Explanation of some of the symptoms.—Having thus enumerated the prominent morbid appearances, we proceed to observe the elucidation which the symptoms derive from their consideration; and in few diseases is such a comparison more satisfactory than in phthisis.

After the state of constitutional irritation and feebleness which precede, and evidently mark, the approach and the commencement of evil, we notice the dry cough caused by the presence of the first tubercular deposits within the lungs; the morning expectoration, as the necessity arises of expelling the mucus which has accumulated during the night, from the excitement of the bronchial membrane, while still the tubercles are unchanged; the gradual alteration which the mucus undergoes during the state of bronchial inflammation which follows; and the particles of blood which escape from the turgid vessels of the bronchial tubes. Then follows the time when, the tubercular deposit increasing, a manifest reduction takes place in the capacity of the lungs; and hence the proportionate increase in the rapidity of breathing, the pulse at the same time generally keeping pace with the respiration, or still further hurried on by the increasing irritation of the disease, now become no less local than constitutional. The tubercles may remain long in the comparatively quiescent state, but sooner or later their softened structure shows itself mingled with the secretion of the bronchi, and according to the varying proportions of the pus and mucus coughed up, does the character of the expectoration vary; sometimes the thin pus passes in almost a fluid state along the tubes; sometimes the mucus obstructing its passage, the frequent effort requisite for its expulsion

mingles it with air and renders it frothy as well as tenacious; sometimes the thickened pus passing slowly through the tube lined with mucus, forms figured or even hardened pellets before it makes its escape, and now and then a small portion of lung, detached by the disease, forces its way through the larger bronchi. The blood now is given off in greater quantities from corroded vessels; or being drawn back into those portions of the lungs where respiration is still carried on, easily puts a stop to this indispensable function. That hectic fever should accompany so much disease, or that emaciation more or less rapid should result from each consecutive stage of its progress, cannot require explanation or remark. The morbid condition of the stomach, of the intestines, and of the glands, so generally discovered, affords a sufficient cause for all the diarrhœa, the frequent vomiting, and the capricious appetite which form the seldom-failing features of the disease. Turning to the indications afforded by the stethoscope, we find, as must almost necessarily be the case, an equally obvious connexion between these and the morbid condition of the lungs. While yet the tubercles are small, and most probably widely disseminated, neither the stethoscope nor percussion yields very obvious signs, as the air still passes into the different portions of the lungs with tolerable ease. It is not, however, long before a certain inequality is distinguishable in the distribution of the respiratory murmur; in parts it approaches to puerile, in others different degrees of crepitus are heard, and in some the respiration is more or less indistinct, and when percussion is carefully practised slight deviation from the natural resonance will be discovered. These different indications become much more obvious as the disease increases, and the tubercles multiply and enlarge; at first

they are generally confined to the space under the clavicle on each side before, and to the parts surrounding the scapulæ behind; but they gradually extend lower in the chest. As the tubercles soften, and as they slowly discharge themselves, the stethoscope or the simple ear enables us to perceive unwonted sounds occupying the place of the respiratory murmur, which is now nearly lost over the whole space injured by disease. The air passing down the bronchi obstructed by mucus and pus, produces the mucous rattle; on entering the cavities and forcibly mingling with their fluid contents, it gives rise to the gurgling sound that is heard either during inspiration or on the patient coughing; the lung being more or less consolidated by the tubercular deposit and probably also by inflammation, there is dulness of sound on percussion, with tubular respiration; and as the lung under such circumstances becomes a better conductor of sound, we either have the preternatural resonance of the voice called bronchophony, or when with consolidation there is a cavity, that more exquisite degree of it which has received the name of pectoriloquy.

Causes.—Since phthisis pulmonalis must be considered as the local manifestation of a constitutional disease, the causes will in part be such as act on the system generally, and in part such as influence the lungs more directly; and though the predisposing and the exciting causes will often run into each other, the former will rather be found in the constitutional, the latter in the local sources of derangement. Whatever weakens the general powers of the system already prone to tubercular disease, will act, not only as a predisposing, but as an exciting cause of phthisis; hence great anxiety of mind; the morbid mental susceptibility frequent in young females; exhaustion of the

bodily powers—by over exertion, by weakening chronic discharges, by continued watching, by privations, or by intemperance,—all prove the frequent sources of this disease; while repressed perspiration, checked catamenial discharge, pneumonia in its various forms and modifications as arising accidentally or connected with exanthematous or other fevers; bronchial inflammation—excited by epidemic influence, by atmospheric changes, by the inhalation of irritating substances, or by other accidental causes,—will become the more immediate sources of the development of tubercles in the substance of the lungs. How far contagion is to be admitted amongst the exciting causes of phthisis will perhaps ever remain a matter of dispute; certain however it is, that more than sufficient evidence exists, that those who too narrowly watch over the declining health of their relatives and friends while gradually sinking under this melancholy disease, often fall victims to the same complaint; and although frequently the predisposition may be plainly traced, and the circumstances of anxiety, of disturbed rest, of confinement and of unwholesome atmosphere, afford abundant explanations of the event, still the uncertainty in which the question is involved fully authorizes us, and even peremptorily commands us, to adopt every precaution which prudent foresight can suggest.

Diagnosis of Phthisis.—When a person is observed to possess those peculiarities of constitution and aspect which have been pointed out as characterizing a scrofulous or tubercular tendency, we ought at all times to entertain some degree of apprehension, and attentively watch the insidious approach of the disease. When tubercles have been actually deposited, it is extremely difficult in most instances to determine their presence, so long as they

continue in a crude state; neither the symptoms nor physical signs being such in general as to render us much assistance. If, however, in a person of tubercular constitution and aspect, and whose family are known to have betrayed a phthisical tendency, we observe any unusual hurry of respiration on slight exertion, a short dry cough, some degree of emaciation, incurvation of the nails, or increasing paleness of the countenance, there will be good grounds for suspicion. This suspicion will be further increased, if on inspecting the chest we observe diminished mobility of the superior ribs of one side, and if on auscultation we discover that the respiratory murmur is weaker towards the apex of the lung of that side than the other, that it is of unequal intensity at different points, and accompanied by a degree of resonance both of the voice and cough perceptibly greater than in the opposite lung. It must, however, be remembered that from the size and situation of the right bronchus, the resonance of voice in the apex of the right lung is naturally greater than in the left. As the disease advances, the more decided cough, probably with occasional slight hæmoptysis, the increasing shortness of breath, the more manifest loss of flesh and strength, the habitual acceleration and sharpness or hardness of the pulse, the vague pains in the chest, the flattening and immobility of the ribs below the clavicle, the more obvious feebleness and irregularity of the respiratory murmur and dulness of sound on percussion, the increasing resonance of the voice and cough, probably with tubular respiration or with slight crepitating or mucous rattle, will almost confirm our worst apprehensions; whilst at a still more advanced period, the purulent expectoration, the hectic fever, the rapid emaciation, the absence of respiratory murmur, the very manifest flatten-

ing of the ribs, the more or less complete dulness of sound on percussion, the mucous or gurgling rattle, the tubular respiration, the bronchophony and pectoriloquy, remove every doubt, as well as every hope, as to the fate of the patient.

The principal cause of difficulty in the diagnosis between phthisis and bronchitis is the frequent complication of the two diseases ; for in most cases of phthisis even at an early period, and necessarily in every case when advanced to disorganization, we have more or less bronchitis associated with it ; whilst on the other hand an attack of bronchitis accidentally supervening on phthisis may so mask or obscure the physical signs of the latter that we cannot by symptoms alone arrive at any satisfactory conclusion. Nevertheless, in a very large majority of cases, the diagnosis is not attended with much difficulty. The manner and progress of the attack, as well as the general aspect and condition of the patient, will materially assist us. In phthisis the symptoms are at first extremely slight, insidious, and tardy in their progress ; in bronchitis, however mild in degree, the original seizure is for the most part more abrupt and strongly marked : in phthisis, the patient usually presents a scrofulous or tubercular aspect, looks pale and more or less emaciated ; in bronchitis these indications are much less, or not at all, apparent, the patient in general very little emaciated, whilst his countenance is frequently suffused, dingy, and perhaps somewhat bloated : phthisis is often preceded or accompanied by hæmoptysis, which is seldom the case in bronchitis : in phthisis the signs of obstruction in the lungs are at first, and often till the termination of the disorder, in a great measure limited to the superior part of one or both lungs ; in bronchitis this is very rarely the case, the signs of ob-

struction being more extensively diffused, and much more commonly affecting both lungs simultaneously : in phthisis we in general detect dulness on percussion, tubular respiration, bronchophony, and from time to time pectoriloquy ; in bronchitis we have merely the mucous, sibilant, and sonorous rattles, with natural or perhaps excessive resonance on percussion : in phthisis there is sooner or later flattening of the ribs below the clavicle, which is not the case in bronchitis : in phthisis we have occasional accessions of pneumonic and pleuritic inflammation, as well as symptoms of continued hectic ; in most cases of bronchitis none of these are observed.

Many attempts have been made to establish a distinction between phthisis and bronchitis, founded on the purulent expectoration of the former, and mucous secretion of the latter. Thus pus is said to present a homogeneous and creamy appearance, and to be miscible with water, whilst mucus is viscid, stringy, and not miscible with water ; pus is heavier and sinks, mucus lighter and swims in water ; pus consisting of globules produces an iridescence when placed between two plates of glass, which is not the case with mucus. These differences are not without their value, and little would be the difficulty in distinguishing the two diseases, when attended with expectoration, provided the one uniformly furnished a purely mucous and the other purulent secretion. Unfortunately when phthisis has advanced to disorganization it is always accompanied by morbid secretion from the bronchial membrane, which, as in ordinary bronchitis, usually puts on the character of what is called puriform mucus, and which appears to combine more or less of the characters of both mucus and pus.

Chemical examination renders it probable that *mucus*

consists of albumen held in solution in such a manner as not to be precipitated by ordinary reagents. The solvent has been suspected to be alkaline, and to consist wholly or in part of soda; *pus* manifestly consists of globules of uncombined albumen swimming in serum, whereas *puriform mucus* seems to consist of mucus mixed with a very small but variable proportion of uncombined globular albumen. From the close relation, therefore, existing between *pus* and *puriform mucus*, no single test hitherto devised has been found sufficient to distinguish them with certainty. The principal differences observed in mucus, *puriform mucus*, and *pus*, are represented in the following table.

Tabular View of the differences existing in Mucus, Puriform Mucus, and Pus (Thoracic).

	<i>Mucus.</i>	<i>Puriform Mucus.</i>	<i>Pus.</i>
Aspect with the naked eye.	Turbid from a suspension of air-bubbles, becoming limpid by repose.	Turbid matter so viscid as to hang in a continuous string from one vessel to another.	Homogeneous creamy fluid.
Under the microscope.	Nothing like definite structure.	No definite structure; a few globules of albumen occasionally perceptible.	Globular particles swimming in a colourless fluid.
Litmus paper.	No reaction.	Generally no reaction, but if any slightly alkaline.	Generally none, if any slightly acid.
Ebullition.	No material change.	Little or no material change.	Firm coagulation.
Sulphuric acid.	Forms a pale reddish solution, which remains limpid after dilution with water.	The same as mucus.	Forms a deep red solution, which by dilution loses its colour, and becomes turbid like milk.
Nitric acid.	Appears at first to coagulate it, then dissolves it, forming a yellowish solution.	Same as with mucus, the solution being effected with difficulty, and not until after boiling.	Dissolves instantly, forming a deep yellow solution.
Hydrochloric acid.	Dissolves it, forming a lilac solution.	Dissolves with difficulty, and not until after the application of heat, forming a lilac solution.	As with puriform mucus.
Acetic acid.	Appears to coagulate it, causing it to resemble a contracted corrugated membrane floating on the acid.	As with simple mucus.	Readily mixes with it, forming a creamy mixture.
Evaporation and subsequent incineration.	Leaves a white ash free from iron.	Leaves a white ash nearly or altogether free from iron.	Leaves a red ash containing iron.

From ordinary *pulmonary apoplexy*, phthisis is to be distinguished by the history of the case, by the aspect of the patient, by a careful analysis of the signs and symptoms, and by the absence of the sudden and profuse hæmoptysis so usually present in the former. The physical signs are often very fallacious, pulmonary apoplexy necessarily giving rise to consolidation of the lung and its consequences as well as phthisis, and when it takes place in the neighbourhood of the large bronchi towards the apex often gives rise to a bronchophony so clear and distinct as with difficulty to be distinguished from pectoriloquy, which is the sign usually but erroneously regarded as pathognomic of phthisis. The difficulty of diagnosis is further increased by pulmonary apoplexy being often succeeded by a copious mucopurulent secretion from the bronchi, and by its not unfrequently supervening upon phthisical disease previously existing in the lungs. In original pulmonary apoplexy, and in that connected with diseased heart, we have generally found the sanguineous effusion, and consequently the physical signs, situated lower down than in phthisis, which we know most frequently affects the apex of the lung.

Empyema, dilated bronchi, acute and chronic pneumonia, have all been mistaken for phthisis, and are to be distinguished from it by the signs and symptoms already pointed out under the head of each. One or more of these, however, may be complicated with it.

Chlorosis and hysteric cough have occasionally been mistaken for phthisis; the absence of the diagnostic physical signs, and the incongruity of the various symptoms will generally enable us to come to a correct conclusion; but here, likewise, we must bear in mind that

these affections, like the others, are frequently accidental complications.

The *prognosis* in this disease is always unfavourable ; the simple suspicion of its existence is enough to awaken our well-founded alarm for the result, and there is great reason to believe that a large majority of those who have been supposed to recover have in fact never been affected with this specific form of disease ; indeed, looking to the difficulties which attend the diagnosis, it is rather a matter of surprise that the cases of supposed recovery are so few ; but this may in part be explained by the fact that many of those diseases whose existence lead to error, themselves pave the way for the subsequent deposit of tubercles. Still, however, as we have no doubt that cases do occasionally recover, and as in some cases the disease is much more protracted than in others, there is room for the formation of a more or less unfavourable prognosis ; and this must chiefly be founded on the greater or less extent of the diseased portion of the lung, the degree of constitutional irritation, and the known constitutional tendency. Thus, for instance, if we can, by the careful use of the stethoscope and percussion, ascertain that the disease is confined to the upper portion of one lung, and if we find the general health apparently good, and more particularly the pulse tranquil and soft, we may even entertain hope of perfect recovery, or at least that the progress will be slow, if proper means are adopted ; nor would the circumstance of the disease being considerably advanced in that circumscribed space greatly diminish our hope of the longer continuance of life, for a single mass of softened tubercles is, after all, a much less formidable disease than an extensive deposit of tubercles in their crude state. Rapidity of the pulse is always to be considered a bad symptom.

The dyspnœa, likewise, as it generally keeps pace with the progress of the disease in the lungs, presents a pretty faithful indication, unless some complication exist, as hepatization of the lung, pleuritic effusion, disease of the heart, a narrow and deformed chest, or perhaps an hysteric diathesis, all of which may hurry on the breathing, so that it may become no sufficient index of the progress which phthisis is making. When in conjunction with other undoubted symptoms, the hectic fever has begun to show itself, our hopes rapidly diminish ; and at all times a knowledge that other members of the family have died of the disease, renders our prognosis more unfavourable.

Treatment of Phthisis.—The treatment of this disease is either preventive, curative, or palliative ; and in the first place, above almost every other disease, it demands a strict attention to all the methods of prevention. From its truly hereditary nature, and from the significant marks which it presents long before it is confirmed, it admits of this method of treatment in a very peculiar degree ; and without subjecting himself to the imputation of being fanciful or theoretical, the medical man may fairly call upon parents, but more particularly where the tubercular diathesis is known to prevail, to submit their children to domestic treatment from the very first hours of their birth. It is certain that there is no period of life so young but the disease may already be developed ; and it is as certain, and still more important, that when the disease is not developed, the constitutional tendency may nevertheless exist. Whatever is calculated to give strength and wholesome vigour to the frame while yet its most tender structures are in process of perfecting themselves, should be included in our early lessons to the nurse and to the

mother. Wholesome air and habitation, a well-ventilated nursery, warm but not oppressive clothing, a scrupulous observance of cleanliness, a good breast of milk provided by a wet-nurse if the mother should from any cause be unable to afford it, and the strictest daily attention to the condition of the bowels; these are the chief objects to which our instructions are now to point. As months and years pass on, the growing child requires constant care to regulate its exercise, which should be remote from every excess, healthful and vigorous, and always proportioned to its strength, exposing its young limbs freely but not carelessly, that it may early acquire the power of bearing the atmospheric vicissitudes to which it must necessarily submit. As the diet becomes more varied, the greater the necessity of avoiding irregularity in the hours of meals, incongruous mixtures, and an overloaded stomach; and while every care is taken to supply ample nutrition in a simple form, all excessive feeding, over-stimulating food, or the introduction of matters which the system will not easily assimilate, must be cautiously prohibited. During the whole period of infancy and childhood a watchful eye must be directed to the progress of all casual inflammatory attacks, all commotions set up in the system, all infantile diseases; no apparently trivial cough, no huskiness of the voice, no chronic enlargement either internal or external about the throat, no loss of the healthful countenance, no unusual listlessness of manner or unwillingness to exertion, no quickness of pulse, no occasional pain in the chest, no complaint, in short, is to be neglected nor to be suffered to run on; and if any circumstance can be discovered, either as regards the abode, the diet, the mode of life, or any other point which admits of being changed with advantage, no time should be lost. The fresh air of the

country or the tonic effects of the sea-side will often do much, after the stomach and bowels have been regulated, provided no decidedly inflammatory action is going on.

Childhood and boyhood being fairly passed, we can no longer expect to obtain implicit attention to the rules we lay down; excesses in exercise, in stimulating food, or even in study, and imprudent exposures to cold and to wet, and neglect of the first symptoms of disease, are the errors against which it is our duty to caution the young man in whom the tubercular diathesis, stifled and overcome for a time, is still ready to display itself, if the powers of the system are squandered, or the natural tendency to over-action is heedlessly encouraged; and yet we must be very cautious not to carry our anxiety too far, for it is a fact the most undoubted, that within the limits of rational hardihood exposure to the open air and to the vicissitudes of the atmosphere is the best safeguard from the attacks of phthisis in those who are predisposed.

To the young female, the period of adolescence is still more dangerous and still more trying, and the adoption of precautionary treatment still more frequently and more essentially necessary. The artificial mode of life to which she seldom fails to be subjected, is most prejudicial to the establishment and maintenance of vigorous health; the vascular and nervous system, weakened by want of proper exercise, of appropriate food, and of wholesome recreation, are alternately excited and depressed, the natural functions of the body are interrupted, and frequently the mind, led away by the imagination, lost in a wilderness of hope and despondency, seems to refuse its aid in warding off the approaches of a disease which lies hidden, but to seize the moment of its victim's weakness.

If, then, at this trying period the faintest symptoms of

disease appear, a complete change must, if possible, be made in all the habits and the associations of the patient, and the individual symptoms must direct our remedial means. These symptoms, as yet the faint markings of incipient ailment, are rather the shadowings of futurity than the results or expressions of existing disease; and often is the physician more indebted to the sagacity of friends, who perceive the gradual deviations from the customary manner, than to his own observation for their detection. The more decided departures from bodily health are generally referable to the condition of the bowels and of the catamenial discharge, while the morbid influence exercised on the mind shows itself by increased irritability of the disposition, and more frequently by a wearing self-reproach, or an abstract reflection on points connected with morality and religion, which is as alien to the natural turn of the patient's mind as it is to the period of life in which it occurs. In such cases it is better to direct the attention to the body than abruptly to interfere with the prepossessions of the mind; and in the majority of instances it will require but little time to discover in the condition of the former, but more particularly in the state of the bowels, a sufficiently obvious indication of treatment; when these are constipated, as is more usually the case, the loaded state of the large intestines induces congestion in the liver and in the lungs, with the same or some corresponding and dependent condition in the brain. The active employment of purgatives relieves them all, and restores the mental activity, while it averts the threatened mischief in the lungs.

In these cases, purgatives which contain aloes with the foetid gums are best, as the aloes and myrrh pill with the compound galbanum, rendered more active if necessary

by a few grains of scammony or of the compound extract of colocynth ; to which, from time to time at long intervals, a slight mercurial may be added, the necessity of such addition being deduced from the appearance of the stools. Should the bowels be relaxed, very different means will of course be requisite ; but even then not unfrequently gentle laxatives and mild mercurials may be required before astringents are admissible. While in this way attention is paid to the results of digestion, not less is requisite with regard to the food taken in and to the condition of the stomach which is to digest it ; the powers of that organ must be supported by strict attention to the external circumstances of exercise and clothing, on the careful regulation of which the important function of the skin likewise depends ; and with this view we may recommend horse exercise, healthful exposure to the air, and a return to more natural habits, and to hours which interfere less with the accustomed periods of rest, and the state of quiescence requisite for digestion.

Should the menstruation be irregular or retarded, it will of course demand most particular attention, requiring probably the use of chalybeates or other means both local and constitutional ; and particular inquiries should always be made as to the existence of any leucorrhœal discharge, which, if not checked by astringent lotions as well as by tonics to the system, will confirm and hasten the progress of pulmonary disease. Amongst the symptoms frequently complained of by young females at this and at other periods of the disease, is a pain more or less constant in the lower part of the chest or below the margin of the ribs ; this will often be removed by a little blue pill, followed by a senna draught, but more frequently it recurs again and again, yielding only when the general strength

is improved. Spirituous fomentations, mustard poultices, or even blisters, may be used with advantage when the complaint is obstinate.

If in connection with a general loss of power and of flesh, and a fading of the healthy complexion or rapid transitions and flushings of the countenance, a hacking cough takes place with slight dyspnœa, and more particularly if the pulse is quickened, we have greatly to dread that the formation of tubercles has already begun.

Treatment of the early stage of the disease.—Little as we can place confidence in medicine, and impossible as it is to speak of remedies as calculated to cure the advanced disease, it is pleasing to feel persuaded that when our preventive means have failed, or when they have been too long neglected and the disease has apparently begun, we can often retard its progress, and occasionally have reason to believe that a cure has actually been effected.

How far we have any right to consider the process by which the tubercle is deposited as the result of inflammatory action, may perhaps be doubted, and if such is the case it is an inflammation accompanied with such weakened power, that it bears a greater analogy to the strumous form of inflammation than to any other, and certainly does not in itself call for, or admit of, active depletion. The early stages of phthisis are however often accompanied by congested abdominal viscera and gorged lungs; very frequently decided inflammatory action is the immediate forerunner of extensive tubercular deposit, and sometimes inflammation arising where the tubercles are deposited gives rise to their active development and increase. It is in all these cases that bleeding may occasionally be useful, but the employment of this powerful remedy requires the greatest caution. When we have an apparently robust young

person to treat, who has probably been growing stout and full although known to be of a tuberculous constitution, and is now attacked with cough and dyspnœa; or when after indulgence or exposure, hæmorrhage has taken place from the lungs, a copious bleeding will be our only security; if, further than this, a state of inflammatory action as discoverable by the stethoscopic signs is found to exist, cautious venescction will be one of our first resources; if during the progress of plthisis the pulse should rise, the countenance grow flushed, the skin remain permanently hot, and lancinating pains be felt in the chest, increased on full inspiration, we have reason to believe, that pneumonic inflammation is set up, and that probably the pleura is involved; here again the abstraction of blood from the arm, or by cupping or leeches from the chest, will be our surest remedy; still, however, bleeding in this disease is the exception rather than the rule, and in a great majority of cases the abstraction of blood even by leeches or by cupping will never be called for. It is of much greater importance in the naturally weak and powerless constitution of the plthisical patient, to obviate the tendency to an irregular distribution of blood and to local visceral congestion, by strict attention to the condition of the bowels and of the assistant chylopoietic organs, inquiring minutely into the character of the evacuations, for by that we ascertain in a great degree the perfection of digestion, and at all events, from the appearance of the alvine discharges, we obtain important information as to the state of that function. We shall often find that the digestion is extremely defective, and when this is the case, gentle mercurials, given so as to procure their purgative effects, will be found most valuable; as, for instance, three or four grains of the hydrargyrum c̄ cretâ, repeated for two

nights, and followed by a rhubarb draught or a dose of castor oil in the morning, or a few grains of blue pill with rhubarb given occasionally at bed-time. While, however, we endeavour to prevent accumulations and correct defective secretions, we must be careful not to irritate the bowels, for it will occasionally happen that the effects of the incautious administration of a single purgative will be felt for weeks, eventually shortening life, and we know that as the disease advances, the bowels seldom fail to show a tendency to increased irritability. Though we occasionally use mercurials, the milder remedies are generally more required, some mild laxative being sometimes necessary almost every morning, as half a drachm or a drachm of manna in a draught of the decoction of Iceland moss, or a few grains of magnesia with half a drachm of the sodæ potassio-tartras in some gently tonic infusion or in aromatic water.

Should the bowels become relaxed in the early stage of the disease, we shall generally find the simple astringents, as the chalk mixture with four or five drops of tincture of opium, and a few grains of aromatic confection, together with regulation of the diet, sufficient to restore the tone of the intestines.

Emetics form a class of medicines upon which much reliance has been placed in the early stages of phthisis, and there is no doubt of their being occasionally very valuable. They act most powerfully in diffusing the circulation, they promote an action of the stomach which frequently produces a decidedly beneficial effect upon its secretion, they also unload the bronchial tubes, by which in the opinion of some, they not only retard the action on which the tubercular disease depends, but actually remove the incipient tubercular deposit.

When remedies of this class are carried so far only as to produce their nauseating effects they exert a powerful influence in subduing inordinate action, and hence may in part perhaps be explained the good effects produced by sea voyages. The emetic most used is the ipecacuanha, either in infusion or in powder, in doses of ten or fifteen grains; but if the strength of the patient be good, the tartarized antimony may be employed for the purpose in grain doses. The latter, when given in doses of one eighth or one fourth of a grain frequently repeated, is one of the most powerful remedies we possess for reducing inflammatory action.

Next to the condition of the stomach and bowels nothing is of greater importance than that of the skin, and on the due regulation of its functions much must depend. This organ sympathises closely with the lungs, and is found throughout the whole course of phthisis to suffer essential derangement, which is most frequently shown by its tendency to excessive action, alternating, however, with a dry and parched condition, to which for the moment, the most weakening perspiration appears preferable to the patient. It is to the effects produced upon the skin, that a great part of the benefit derived from residence in a mild climate is probably attributable. Moderately warm clothing is likewise of great importance, and the daily washing a large portion of the body in vinegar and water or in salt water, the parts being afterwards carefully rubbed, is an excellent means of keeping up the healthful tone of the organ; whilst if circumstances will permit, and the strength of the patient be good, the tepid bath may occasionally be used, followed by assiduous friction.

The irritable cough, which forms an alarming feature in the commencement of phthisis, and which is perhaps

independent of any tubercular formation, should always be checked as soon as possible, not only as being a sign of disease, but as being likely to favour the development of tubercles which probably at present do not exist. Various remedies may be employed for this purpose, but few are better than a pill composed of two grains of the extract of conium, two of the extract of poppies, and a grain of ipecacuanha. The hydrocyanic acid in doses of one or two minims in any aromatic water, or a few drops of the liquor opii sedativus, may be mentioned amongst the most permanently useful.

Having thus regulated most of the collateral circumstances of the disease, we have undoubtedly placed the lungs in a situation more favourable for recovery. We must not, however, be contented, though the obvious symptoms should all of them have greatly subsided,—the pulse have been considerably reduced, the bowels become regular, and the cough ceased. The symptoms having once convinced us of the existence or the probable existence of the disease, we must not neglect to follow up the advantage we have gained by every means in our power. This is the time when tonics may, though always with great caution, be administered. The different preparations of sarsaparilla may be used with advantage; and if there be any tendency to deficient menstruation, the steel mixture and other chalybeates. If, on the contrary, menstruation be profuse, the mineral acids, both the dilute sulphuric and the hydrochloric. Should leucorrhœa be present, it is far too important a source and evidence of debility to be neglected; and in addition to the various tonic remedies, local astringents in the form of washes must be employed.

If at any time during the administration of tonics the

pulse begins to rise, or evidence of excitement appear, all such remedies must be laid aside, and the generous diet on which the patient has been placed must for a time at least be interrupted.

With regard to diet, exercise, and exposure, these are of the utmost importance in a curative point of view. The plan of diet can only be laid down with reference to each particular case; the great rule however is, that it should be as generous as can be borne without producing excitement, and in many cases may extend even to the taking of animal food in small quantities twice a day, and the drinking of malt liquor and even a glass of wine at dinner; but all these stimulating foods can only be allowed while the patient is under careful watching, and more often milk and farinaceous foods will form the greater part of the diet. The exercise, like the diet, will depend upon the state of the patient. Nothing which so far hurries on the circulation through the lungs as to excite a cough however trivial, or to produce an impression of dyspnœa however slight, can be useful; and therefore horse exercise, or in fine weather, passive exercise in an open carriage or in a boat, will be preferable to exercise on foot.

Atmospheric exposure is another very important point; during the winter months in our variable climate it is inadmissible, but no sooner does the fine weather, which usually comes on by the month of May, enable the patient to get out than cautious trials should be made; they should be increased and persevered in through all the summer and even the autumnal months, always remembering that rash exposure must be carefully avoided, as sitting in currents of air or wearing damp clothing, and whatever calls for more than the moderate exercise of the power of generating animal heat. As a valuable assistant

in the tonic plan of treatment, the tepid or even the cold salt-water shower-bath may be employed. Stimulating applications to the upper part of the chest, as the linimentum camphoræ compositum, or the linimentum ammoniæ, or even those which might excite a moderate rash upon the part, as the liniment. antimonii potassio-tartratis, may be used.

It is at this stage of the disease that sea voyages and residence in a milder climate are to be recommended. If we leave these to a much later period, the sacrifices of domestic comfort and the expense and toil of travelling are undertaken with scarcely a chance of any adequate benefit; whereas at this time, if the patient can be so placed, that for a winter or two, he is able to pursue his exercise in the open air without breathing an atmosphere which at every inhalation irritates the bronchial tubes, and without exposing the surface of his body to be chilled, and the perspiration to be checked, at every hour of the day, a great deal of benefit may result, and the cure which is begun may be completed, or at all events the progress of the disease be greatly retarded. For this purpose England should be left early in October and not revisited till the following June. A voyage to the West Indies and a short residence in some of the more healthy islands, as Barbadoes or St. Vincent, or a longer residence in Madeira, appear to be amongst the most desirable trips for a phthisical patient; or a residence in the South of Europe, as at Pisa or Rome, may in some cases be preferred.

If from circumstances the patient cannot quit England, the various retreats upon the southern coast of Devonshire and Cornwall, or perhaps Hastings, may be visited with advantage. It sometimes happens, particularly to those who reside in populous towns, that they are obliged

to seek for a change of air during the summer likewise; and here it is very right to bear in mind that excessive heat frequently hurries on the disease as rapidly as cold, so that the best situations will be those which, with a sufficient shelter around the immediate residence, afford the opportunity of fresh air and healthful rides in the neighbourhood; such situations present themselves about Reigate, Dorking, and the Surrey Hills, or at a greater distance from London in the neighbourhood of Malvern or some of the retired parts of Wales, or if the sea air is known to agree and sailing is desirable, Cowes in the Isle of Wight perhaps combines as many advantages as any place for a summer residence; at the same time occasional changes from one place to another will often not only amuse but actually benefit the invalid, and hence, while the season is favourable his own wishes may be allowed in a great degree to regulate his wanderings.

Treatment of confirmed Phthisis.—When phthisis has become confirmed, and the symptoms are no longer to all appearance such as can be disputed, our treatment must from the nature of the disease be in a great degree palliative; yet we must never lose sight of the fact, that few years pass, in which, cases unhesitatingly pronounced to have been confirmed and even advanced phthisis, have not recovered completely, or at all events obtained such a degree of relief that the threatened fatal issue has been indefinitely postponed. Almost all the observations which have been made, and rules laid down, as likely to conduce to the healthy discharge of the various functions of the system in the earlier stages, are equally applicable in this, and should never be neglected under the idea that the disease is advanced too far for cure. The strength must be well supported by mild nu-

triment and the free administration of pure air, moderated in its temperature according to the season. Gentle exercise in a carriage, a boat, or on horseback, is still desirable, provided it is not at any time carried to fatigue, nor employed so as to expose the patient to the powerful rays of the sun or the chilling effects of cold winds.

One of the great objects in the treatment of confirmed phthisis is to guard against sudden accessions of inflammatory action and to discover them as soon as they arise; but the prevention is in this case much more important, for unfortunately the patient is seldom in a state to bear anything like active depletion. Still, however, should the indications of an attack of pneumonia or pleuritis show themselves, we may often with safety and with advantage take away from six to ten ounces of blood, according to the strength of the patient, or we may apply a cupping-glass to the chest and take a few ounces locally, at the same time reducing the diet, determining to the skin, and acting gently on the bowels; nor must we be too hasty in returning to the more generous or tonic mode of living, as we shall easily bring back the inflammatory condition. Where the tendency to repeated relapses is very marked, we shall do well to keep up some effectual counter-irritation by means of the ointment of the tartrate of antimony, or by issues, setons, or perpetual blisters in the neighbourhood of the part.

Various symptoms are apt to arise in the course of phthisis, and to become of themselves very important, requiring to be checked; of these *perspiration* and *diarrhœa* are the most frequent, the disease seldom running its whole course without the occurrence of one or the other to a degree which renders it the object of treatment. The cough, likewise, and the hæmorrhage from

the lungs, are symptoms which often require the aid of palliative resources when all hope of doing essential good may be passed. Of each of these, therefore, we will say a few words, and first of the *diarrhœa*. This frequently depends upon irregularities or imprudence in diet, and then a gentle laxative, as a scruple of magnesia and ten grains of rhubarb, or a few drachms of castor oil, will often remove it at once; but it is not right to persist in this mode of treatment; and if the laxative does not produce the desired effect, the various astringents should be employed; the chalk mixture, in doses of half an ounce or an ounce, with ten or fifteen grains of aromatic confection; and if this does not succeed, the kino, the catechu, or the hæmatoxylon. Should the tendency to diarrhœa continue, a slight mercurial, as two grains of the hydrarg. \bar{c} cretâ, may be tried, in combination with a few grains of the compound ipecacuanha powder; and it will sometimes be necessary to repeat this every night for several doses before the tendency to relaxation gives way, while at the same time occasional doses of astringents and mild opiates must be administered. Profuse *perspiration* is another of the most distressing and weakening symptoms in the more advanced stages of phthisis, generally coming on as soon as the patient falls asleep in the day or at a very early hour in the morning when he wakes from his first sound sleep. The best remedies are, to avoid heavy and warm clothing, to be careful not to take fluids, particularly warm fluids, about bed-time, and when the state of the bowels will permit to take the mineral acids, particularly the dilute sulphuric acid, in doses of five to ten minims in the infusion of roses, which may be rendered more aromatic by the addition of an infusion of mint. The compound kino powder, likewise, in doses of five

grains or more at night or three times a day, will often relieve both the perspiration and the diarrhœa. With regard to the *cough*, it is so essentially a part of the disease developed in the lungs that nothing can entirely overcome it; we may, however, attempt to diminish its violence by various forms of remedy in which the different preparations of the poppy, the lettuce, the ipecacuanha, and the squill are combined with mucilage and syrup.

When *hæmorrhage* takes place to any extent from the lungs it is necessary to enjoin the most perfect tranquillity of mind and body, to keep the patient cool, to prohibit all warm drinks and all stimulating food, to administer the compound infusion of roses with an additional quantity of the sulphuric acid, with or without a drachm or two of the sulphate of magnesia, every six hours, according to the state of the bowels; and if this does not quickly succeed, to give the acetate of lead in doses of one or two grains every second, third, or fourth hour. If the pulse is frequent and strong, the digitalis in grain doses, or the infusion of digitalis in doses of a drachm or two, or the tincture to the extent of eight or ten minims may be used: when the hæmorrhage continues long, a drachm of the spirit of turpentine every six hours has occasionally succeeded when almost everything has failed.

It has been proposed in the treatment of phthisis to attempt to make application locally to the affected lung by inhalation, and for this purpose various substances have been employed with some apparent success, iodine, or chlorine inhaled from a vessel containing warm water, the vapour of tar-water, myrrh, and other balsamic substances suspended in the air; nor is it to be denied that good has occasionally resulted from the practice.

Besides the distinctive changes which take place in the progress of phthisis, the lungs are liable to several other chronic diseases, of which it is right that the student should be aware, although in general their diagnosis is not very distinct, and the treatment of which they admit is very limited and unsatisfactory. The lungs are subject to all the different forms of malignant disease; scirrhus, fungoid, and melanotic growths not unfrequently occupy large portions of these organs; they may be suspected, from the gradually increasing dyspnoea and dry cough by which they are attended, by the deformity they often occasion in the chest, by the dulness on percussion, and the absence of the respiratory murmur in the parts which they occupy, while at the same time many of the symptoms are wanting by which other diseases are marked; but their exact character can only be recognised by the occurrence of similar diseases in other parts and organs of the body, and by the corresponding action excited in the lymphatic glands. There is a peculiar disease, occurring particularly in the lungs of those who work in the coal-mines, in which a kind of spurious melanosis is produced, the whole substance of the lung being pervaded by a black colouring matter, frequently accompanied with black expectoration, and the patient dying with many of the symptoms of phthisis. The lungs are likewise though rarely the seat of hydatids, and occasionally become involved in the effects of hydatids generated in other organs, as the liver, from which viscus the hydatids sometimes make their way through the substance of the lung, and are coughed up mingled with bile and pus and mucus, the result of which is always doubtful, but occasionally such cases terminate well.

ACUTE PERICARDITIS.

Acute pericarditis is often an extremely obscure disease; like pleurisy it consists in inflammation of a serous membrane, and as in pleurisy the symptoms are very much modified by the character and quantity of the effusion. When it attacks persons of a good and hale constitution, in whom the effusion is usually moderate and contains a considerable proportion of organizable albumen, the most obvious if not the most common symptoms are, an acute or burning pain in the region of the heart, sometimes shooting towards the left shoulder or axilla, and occasionally increased by pressing the fourth, fifth, or sixth intercostal spaces, or by forcing the fingers beneath the margins of the ribs to the left of the scrobiculus cordis; augmented impulse and accelerated action of the heart; a sharp or hard pulse; slight cough; sense of anxiety; sometimes delirium or a certain degree of incoherency of manner; and a difficulty in lying on the left side. These symptoms are perhaps sooner or later succeeded by a diminution of the heart's impulse; a less rapid, softer, easily compressible, but still somewhat jerking pulse; increased anxiety and dyspnœa; till at length, unless the disease subside or be subdued by art, the heart appears to be nearly overpowered by the inflammation and its products; it beats feebly, irregularly, and with great rapidity; the anxiety and sense of suffocation become extreme; the patient cannot lie down; he leans forward; he labours for breath; cold clammy sweats break out; and he dies. This description, however, must be regarded as applicable only to the most exquisite and severe form of acute pericarditis attacking persons of good constitu-

tion; for in by far the largest proportion of even acute cases occurring in hale subjects, the symptoms are by no means so urgent or alarming, and are not unfrequently extremely slight, or perhaps entirely escape the notice of the medical attendant, the disease being unexpectedly discovered on examination after death. When, on the contrary, active inflammation attacks persons of a scrofulous, and more especially those of a cachectic habit of body, in whom the effusion is usually copious, and contains but a small proportion of organizable albumen, the progress to alarming symptoms is always much more certain as well as more rapid, the violent action of the heart is soon overpowered, and as the effusion increases it beats so feebly and irregularly as scarcely to be heard on applying the ear to the chest; the pulse is correspondingly feeble, irregular, and indistinct; the dyspnœa, sense of suffocation, and anguish speedily attain a considerable degree of intensity; the patient is unable to lie down, and for the most part dies at a much earlier period than when the disease, even in its most aggravated form, occurs in persons of a better constitution.

The *physical signs*, as well as the symptoms, are determined in a great measure by the period of the disorder and by the quantity and quality of the effusion. When the disease occurs in good constitutions, we for the most part have the heart's impulse considerably increased in the first instance and attended with the bruit de soufflet, and not unfrequently with an irregularly diffused but more or less superficial rubbing sound, or that peculiar modification of it which has been compared to the creaking of new leather; but when the disease occurs in bad constitutions, and when, consequently, the effusion is rapid and abundant, none of the physical signs mentioned are

nearly so distinct, or if present at all, quickly disappear, and are succeeded by remarkable feebleness and irregularity of the heart's impulse, with extensive dulness on percussion over the præcordial region.

In regard to the *morbid appearances* found after death, it must be observed that in examining the bodies of individuals who have died of very different diseases, and who had afforded no indications whatever of pericarditis during life, we often find traces of slight but recent inflammation; such as, increased quantity or turbidity of the serum usually met with, a clamminess of the serous surface, or even flakes or films of solid albumen. In decidedly original pericarditis, however, the appearances are much more striking, and vary, as in pleurisy, according to the period and intensity of the disease, and the age and constitution of the patient. In some cases, we find the effusion moderate, the serum being in small quantity, and the proportion of solid albumen considerable, the latter either uniting the two pericardial surfaces together, or merely deposited upon them in a granular or reticulated form, or stretching across from the one to the other in the form of beautiful festoons. In some rare instances we find the internal membrane of one or both sides of the heart presenting indications of recent inflammation, together with a more or less extensive deposition of albumen upon it, or upon the valves of the respective cavity or cavities affected. Sometimes there are no adhesions whatever between the two pericardial surfaces, the effusion consisting almost entirely of serum, rendered turbid, perhaps, by flaky or granular albumen, and with only a thin semipellucid and gelatinous-looking adventitious membrane covering a greater or less portion of either the loose or attached pericardium; whilst in other instances, the pericardium

is found to contain a fluid having a more decidedly puriform character.

Causes of Pericarditis.—It has already been observed that indications of slight pericarditis are not unfrequently met with in fatal cases of various diseases, the causes which produced it being altogether unknown. Even in the more original forms of the disorder, we often fail to trace either its predisposing or exciting causes. It may undoubtedly be induced by the ordinary causes of the phlegmasiæ in general, and it may be excited by mechanical violence; but so far as we yet know, its ordinary cause is rheumatism, in the progress of which disease it is of extremely frequent occurrence, its frequency, however, being greater the younger the patient. It may also supervene in its acute form upon influenza, smallpox, renal dropsy, and some other acute diseases.

Diagnosis.—It has been stated that the signs and symptoms of acute pericarditis are sometimes so slight as to escape notice altogether, or at most are such as not to be recognised; but it is probably not less true, that the number of such obscure cases would be greatly diminished provided the good practical rule were observed of uniformly investigating with care, the condition of each individual organ of importance in every disease of whatever kind and character. When the disease is well marked, the pain or burning heat in the region of the heart, the increased impulse of the organ, the frequent sharp or hard pulse, the palpitations, the faintness or anxiety, the slight cough and dyspnœa, the rubbing sound and the bruit de soufflet, in the early stage; and the feeble undulating impulse of the heart, the frequent feeble and irregular pulse, the extreme anxiety or faintness, the orthopnœa, and the extensive dulness of sound over the præcordial region in the advanced stage of the disorder,

together with the absence of the ordinary signs and symptoms of other diseases of the chest, will very often sufficiently declare the nature of the complaint. Of course, the fewer the symptoms developed in any particular case, the greater will be the difficulty of diagnosis; but inasmuch as acute pericarditis very rarely occurs except in conjunction with rheumatism, and as the probability of its occurrence in that disease is great in proportion to the youth of the patient, we are put upon our guard, and are often enabled to recognise symptoms which would otherwise entirely escape our observation. In every case of acute rheumatism, therefore, the patient ought to be repeatedly and carefully examined; and if we perceive any peculiar expression of countenance, tendency to delirium, cough, dyspnœa, palpitation, or any unusual irregularity, frequency, sharpness, or softness of the pulse, the disease may at all times be apprehended; and should the physical signs and increasing urgency of the symptoms countenance the suspicion, there will remain little doubt about the propriety of treating the case as one of acute pericarditis.

Prognosis.—Our prognosis has reference either to the immediate safety of the patient or to his ultimate and complete recovery. As regards the former, we cannot but suspect that the immediate danger has been greatly overrated, of which we think there is sufficient proof to be found in the numerous instances on record in which universal or partial adhesions and other effects of the acute form of the complaint have been unexpectedly discovered, when patients have died of some other disorder, long after the original attack. The immediate danger, therefore, is to be estimated rather from the particular circumstances under which the disease occurs, than from either the importance of the organ or the mere intensity of the inflam-

mation. When acute pericarditis occurs in good constitutions, in whom the effusion is for the most part moderate in quantity and consists chiefly of organizable albumen, the patient will in general under proper treatment recover; when, however, this form of the complaint has been long overlooked or neglected, but especially when the disease occurs in scrofulous, cachectic, or dropsical habits, and when in consequence the effusion is considerable and contains a large proportion of serum or puriform albumen, the danger is at all times great, and the disease often proves fatal. The danger in every instance will be enhanced when the inflammation attacks both the exterior and interior of the heart, and when it happens to be complicated with other diseases.

As regards the complete recovery of the patient, the prognosis is much less favourable, the lingering irritation set up by the inflammation, the permanent adhesions occasioned by it between the opposite surfaces of the pericardium, and the disease of the valves which results when the interior of the heart is involved, often giving rise ultimately to hypertrophy and dilatation of the heart, which, on the accidental supervention of bronchitis or other form of pulmonary complaint, causes such obstruction to the circulation, and such congestion of the liver and other viscera, as almost certainly to terminate sooner or later in dropsy and death. Nevertheless, provided the patient abstain from violent bodily exertion and mental excitement, and observe great care in avoiding the ordinary causes of affections of the chest, he may continue for many years in the enjoyment of moderately good health, notwithstanding the presence of extensive hypertrophy, dilatation, and valvular disease of the heart.

Treatment.—The indications are, to put a stop to the inflammation, and to prevent or arrest effusion and conse-

quent adhesion. These objects are to be accomplished by general and local depletion, and by speedily inducing mercurial action on the system. If the patient be young and of good constitution, and if we be called very early, he may safely be bled from the arm to approaching faintness, and the operation may be repeated on the same or following day to the same extent, should the local pain or oppression and the general symptoms appear to justify it. Immediately after the first bleeding we may give two or three grains of calomel with a grain of opium and a quarter of a grain of tartar emetic, and repeat it every four hours. If any doubt exist as to the propriety of general depletion, cupping over the region of the heart to an amount proportionate to the urgency of the case and the powers of the patient, will be found a most valuable and almost indispensable substitute: indeed, such local depletion seems to be alone necessary in many instances, and certainly proves more efficacious than in most other internal inflammations. Leeches are less powerful, but a blister or a succession of blisters at a later period, will often be found of excellent service. The patient must be confined to bed and put upon the use of slops; his bowels should be gently opened from time to time, if necessary, by senna and salts or castor oil. Some mild diaphoretic may also be given at intervals during the day, such as the liq. ammon. acet. mixture with ten or fifteen minims of vin. ant. pot. tart.; or, if sickness prevail, the effervescing draught with excess of alkali may be substituted. As soon as the system has been brought fully under its influence, the mercury ought either to be entirely withdrawn, or continued in smaller doses once or twice a-day only.

When the disease occurs in scrofulous or cachectic habits, and there are indications of copious effusion, we

must proceed with much caution, employing general blood-letting with less freedom, and substituting for it local depletion, counter-irritation, and smaller doses of the combination of calomel, opium, and antimony, less frequently repeated. As long as any morbid irritability of the heart remains, the patient should observe great quiet both of body and mind, he should live very temperately, avoid exposure to vicissitudes of temperature, and wear flannel next his skin. Together with these precautions, counter-irritation, either by blisters or the antimonial ointment; gentle laxatives, and mild mercurials, with anodynes, digitalis, and other diuretics, may be continued for a longer or shorter period, according to the circumstances of the case.

CHRONIC PERICARDITIS.

Chronic pericarditis may be a sequel of the acute form of the complaint, or it may assume a chronic character from the commencement. The former is not by any means of unfrequent occurrence, and will generally be found to depend upon the state of the patient's constitution and consequent copious and puriform effusion; the latter is principally confined to persons of an impaired or cachectic constitution, but is more especially met with in those who manifest a dropsical tendency in connexion with diseased kidneys, and in those who suffer from chronic diseases of the lungs or from organic diseases of the heart itself. In this originally chronic form, the effusion consists chiefly of transparent serum of a citrine colour, with a very small proportion of solid albumen. When the chronic is a mere sequel of acute pericarditis, it will for the most part be easy to detect and trace the progress of the disorder, but when it assumes a chronic form from the beginning, the

symptoms are often very obscure, especially at an early period. In both forms the effusion is apt to become considerable, and has been known to amount to several pints. Such abundant effusion greatly oppresses the heart, giving rise to a feeble or undulating impulse of the organ, extensive dulness on percussion, frequent palpitations, remarkable faintness or anxiety, inability to rest in the recumbent position, great dyspnœa, especially on exertion or from mere change of position, a frequent, feeble, and often irregular pulse, lividity of countenance, and occasionally œdema of the lower extremities or other dropsical effusions. These symptoms, together with the absence of the ordinary signs of other diseases of the chest, will generally enable us to recognise the complaint; allowance, however, being made for the compression and obstruction of the lung, which will necessarily result when the effusion is abundant. The treatment must be regulated chiefly by the age and constitution of the patient, and will consist of moderate local depletion, counter-irritation, mild mercurials, and diuretics, taking care at the same time to support the patient's strength by a bland nourishing diet.

ORGANIC DISEASES OF THE HEART.

An elaborate inquiry into the history, pathology, signs, and symptoms of the various organic diseases of the heart would be altogether incompatible with the limits of an elementary work. All that can be attempted is to remind the student of the normal action, rythm, and sounds of the heart, apprise him of those comparatively unimportant disorders which are often mistaken for organic disease, and very briefly enumerate the ordinary signs and symptoms attendant on some of the most common lesions of structure.

On applying the stethoscope or naked ear to the præcordial region of a well-formed chest in a healthy person, we perceive that each pulsation of the heart is accompanied by two distinct sounds,—the one dull and somewhat prolonged, the other short and clear; the former is immediately succeeded by the latter, and then a short pause ensues; this natural order and succession constituting what is called the *rhythm* of the heart. The first, or dull and prolonged sound, accompanies the contraction of the ventricles and is synchronous with the blow of the heart's apex against the ribs and with the diastole of the large arteries immediately in the neighbourhood of the organ, but just perceptibly antecedent to the pulse at the wrist; the second, or short and clear sound, immediately succeeds the other, and accompanies the relaxation of the ventricles. The first sound is attributed by some to the impulse of the contracting ventricles upon their fluid contents; by others, to the mere stroke of the apex of the heart against the ribs; by some, the second sound is said to be owing to the reaction of the large arteries and consequent impulse of the blood against the semilunar valves; whilst others ascribe it to the mechanical impulse of the heart against parts situated exterior to it: it is not improbable, however, that both causes cooperate in producing the second sound. The first sound is most distinctly heard below the left nipple in the space between the fifth and sixth ribs, and at the lower part of the sternum; the former situation corresponding to the left, the latter to the right ventricle; the second sound is most distinctly perceived at the upper part of the sternum. The thinner the parietes of the heart, the louder and shorter are the sounds, and the greater is the extent of the chest over which they can be heard; so that when the heart is enlarged or dilated, and the parietes at the same time are

thin, the sounds are not only shorter but may be heard successively over the whole front of the sternum and scrobiculus cordis, beneath the left clavicle or in the left axilla, below the right clavicle, in the dorsal region of the left, and, lastly, in the dorsal region of the right side of the chest, according to the degree of these conditions. The intensity of the sounds of the heart, or the extent over which they may be heard, is also increased by narrowness or deformity of the chest, by consolidation of the lung, by pleuritic effusion, and by certain diseases situated exterior to the organ, but which necessarily irritate it or force it forwards. When, on the contrary, the parietes of the heart are thick, the sounds are more dull and prolonged and more circumscribed, unless with increased thickness of the parietes there is also considerable dilatation of one or more of its cavities.

The force with which the heart strikes or elevates the parietes of the chest at each contraction constitutes its *impulse*. In health the impulse is moderate, and is only felt between the fifth and sixth ribs; when the parietes of the ventricles are thick, it becomes proportionably more powerful, and when the organ is increased in size, is felt over a larger space: should the ventricles, therefore, be hypertrophied and dilated at the same time, both the degree and extent of the impulse and the intensity of the sounds will be augmented. The impulse of the heart is liable to be obscured by the movements of the ribs in the act of respiration, and especially so when the respiration is greatly hurried or impeded.

All the foregoing particulars, as well as the extent over which the heart in its normal state causes dulness on percussion, ought to be carefully remembered by the student when investigating any real or supposed organic disease.

The most common effects of a disordered condition of the heart, are, inordinate action or palpitation, a sense of faintness, irregular action or intermission, preternatural or enfeebled impulse, increase or diminution of the clearness or extent of the normal sounds, *frémissement cataire* or purring tremor either of the heart or of the large arteries, or both, and certain puffing, sawing or rasping sounds, which are abnormal, and for the most part only developed when obstruction exists at some of the orifices, either of the organ itself, or of the large vessels immediately communicating with it. But as most of these, or even several of them in combination, may be produced by merely functional as well as by organic disease, the fact ought ever to be present to the mind of the student, and he will do well in every instance, minutely to inquire into the state of the patient's constitution, and into the condition of particular organs or of particular functions. Such precautions will often be the means of sparing both him and his patients much painful anxiety, by affording a hope or perhaps a conviction, that an apparently serious disease, is, in reality, one of comparatively little or no danger. If the patient be a female, if she be of a naturally susceptible habit of body, if she manifest symptoms of hysteria, if she suffer from irregular, excessive, scanty, or painful menstruation, or labour under leucorrhœa; should either male or female have experienced sudden or violent emotion, or been subjected to protracted anxiety or distress; if in either sex, we find a narrow or otherwise misshapen chest, or observe indications of gout, dyspepsia, or irregularity of the bowels, we shall have good grounds for suspicion; and if on further inquiry we ascertain that the signs or symptoms are very unsteady, and occasionally cease altogether, that there exists no disease of the lungs or large vessels, that the patient has never had an attack

of rheumatism, and that he is free from the throbbing in the head, giddiness or momentary loss of recollection, the habitual shortness of breath or hæmoptysis, the enlargement of the liver and the symptoms of dropsical effusion, which so frequently result from the congestions attendant on organic disease of the heart,—although not amounting to positive certainty, we shall have still greater encouragement to conclude that the disorder is merely functional.

Hypertrophy of the Ventricles.—When hypertrophy exists without dilatation, the impulse is augmented, the sound is duller, somewhat more prolonged than natural, and heard over a very circumscribed space. When it affects the left ventricle, the impulse is most strongly felt between the cartilages of the fifth and sixth ribs of the left side; when the right ventricle is so affected, we are conscious of an increased impulse at the lower part of the sternum; in both, the pulse is regular but strong. In hypertrophy of the left ventricle, the patient often experiences throbbing within the head, giddiness, temporary loss of recollection, or actual apoplexy, and occasionally such congestions of the stomach and liver as lead to hæmatemesis or ascites; whereas, in hypertrophy of the right ventricle, we frequently observe pulsation of the jugulars, more decided congestion of the lungs, hæmoptysis, or even lividity of the surface.

In *Atrophy or thinness of the parietes of the Ventricles*, the sounds are short, loud, and heard over a larger space than natural, and the impulse is feeble, the pulse is sharp and compressible, and the patient often experiences a sense of faintness, or the heart palpitates on slight exertion. When with attenuation of their parietes, the ventricles are at the same time dilated, the sharp and clear sounds are heard over a still greater extent of surface, the feeble impulse is felt beyond the natural limits, there is more ex-

tensive dulness on percussion, and an abnormal sound or bruit not unfrequently accompanies the contraction of the ventricles.

In *hypertrophy with dilatation of the Ventricles*, we find the signs and symptoms of these two states combined; there is dulness on percussion over a large space; the sound of the ventricles is loud or hammering, especially under temporary excitement, and is occasionally accompanied by a bruit; the impulse is very powerful, sometimes amounting to a general heaving of the left side of the chest; and the pulse is either small and feeble, or large and sharp, or jerking. It is in such compound cases that the heart frequently attains an enormous size, and it is in such cases that we so often have a fatal result from bronchitis and dropsy; the signs and symptoms, however, are perpetually varying according to the relative degree of disease existing in the different parts or cavities of the organ.

The most frequent *causes* of organic disease of the heart are, pericarditis, especially as observed in connexion with rheumatism, sudden and violent emotion, long protracted distress of mind, mechanical irritation or violence, obstructive disease of the lungs, more or less general disease of the arteries, and a morbid state of the valves of the heart.

The *treatment* is almost purely palliative, and consists in removing, as far as possible, every cause of excitement of the body and irritation of mind, obviating all sources of obstruction to the free circulation through the lungs, and properly regulating the diet and regimen of the patient. When we have reason to think that the heart is excited by a plethoric condition, very moderate general or local blood-letting may occasionally be employed with advantage; in practising depletion, however, the greatest care must be taken never to induce a state of syncope, which is at

all times dangerous in organic diseases of the heart, and has not unfrequently proved suddenly fatal: the patient therefore should remain for some time in a state of perfect quiet, after the most moderate bleeding. When there is any indication of local inflammatory action, cupping, leeching, blistering, or counter-irritation, by means of the tartar emetic ointment, over the region of the heart, may be had recourse to.

DISEASE OF THE VALVES.

Besides the normal and abnormal sounds of the heart already described, others are occasionally superadded, depending in a large majority of instances upon obstruction to the flow of blood from the ventricle into its corresponding artery. Such obstruction of course may be produced either by actual contraction of the opening from disease of the valves, or by a loss of relation between the ventricle and the arterial outlet, in consequence of the dilatation of the former. These abnormal sounds in most cases accompany the systole of the ventricles; they are observed to resemble the blowing of a pair of bellows, or the noise made by a saw or by a rasp, they are loudest and most distinct when the heart acts with violence, and in some instances are heard at that time only. It must nevertheless be remembered, that nearly similar sounds, or at least the blowing and sawing sounds, not unfrequently arise from temporary and comparatively trivial causes, and independently of any organic disease whatever, as is observed in nervous females, and in chlorosis, or other forms of anæmia.

When positive or relative *obstruction* exists at the *orifice of the aorta*, the abnormal sound or bruit accompanies the systole of the ventricle, and is occasionally such as to

obscure or even supersede the second sound of the heart. When the diseased aortic valves permit the free egress of the blood, but are not sufficiently perfect to prevent the *reflux* of the blood again into the ventricle on the reaction of the artery, the murmur or bruit accompanies or supersedes the second sound of the heart; whereas, if the aortic valves be in such a state as to obstruct the egress of the blood, and at the same time permit its reflux, we then have a double or see-saw sound, whilst both of the natural sounds of the heart are more or less obscured. So long as disease is limited to the aortic orifice, although the character of the pulse varies in other respects, it is pretty uniformly regular, or at most, only temporarily irregular on the application of some additional cause of disturbance of the circulation.

As regards the *mitral valve*, it has been supposed by some that when it is in such a state as to obstruct the free passage of the blood from the auricle into the ventricle, it gives rise to a bruit with the second sound, and that when it permits a reflux into the auricle on the contraction of the ventricle, it may produce a bruit with the first sound of the heart. There are, however, some grounds for calling in question the accuracy of both opinions, and for believing, that disease of the mitral valve seldom, if ever, of itself, gives rise to a bruit of any kind. So long as it is capable of acting as a perfect valve, although thickened or otherwise diseased, no abnormal sound in general is heard beyond perhaps a slight jar or flap, and the pulse continues regular; as soon, however, as it ceases to act as a perfect valve, the action of the heart is liable to become exceedingly tumultuous, and the pulse irregular or intermittent, but very often without any bruit whatever. Since, therefore, we often discover after death, great obstruction occasioned by disease of the mitral

valve, without any bruit having been audible during life, and as in a large proportion of cases of chronic disease of the heart, there is some loss of relation between the ventricles and arterial outlets, it is not improbable that when a bruit has been observed during life to accompany the first sound in cases of diseased mitral valve, it has had its source at the arterial orifice, and not at the auriculo-ventricular opening, as has been supposed.

The most common *causes* of disease of the valves are, endocarditis, and the violence inflicted upon them by original hypertrophy of the heart. In some instances, it would appear as if albuminous matter were deposited upon the valves by the blood itself from some cause independent of inflammation. These latter deposits seem to attach themselves to the valves, become organized, and form warty-looking excrescences or vegetations of various forms and sizes. In other cases the valves undergo a change by which they become thickened, hard, or bony, without any assignable cause whatever.

DILATATION OF THE AORTA.

Dilatation of the aorta within the thorax, often gives rise to symptoms which are liable to be mistaken for disease of the heart, brain, or lungs. On examination after death, we find the dilatation presenting many varieties both in appearance and in degree; it is occasionally limited to, or chiefly affects a *circumscribed* portion of the ascending aorta, or of its arch; at other times it is more *diffused*, involving the ascending aorta, the arch, the large arterial trunks which arise from it, the arteries of the brain, and in some very rare cases even the arteries of the extremities. The interior of the vessel, under such circumstances, is commonly of a muddy or opaque yellow or yellowish white colour, rugous or uneven on its surface,

and often presents beneath its lining membrane atheromatous-looking patches of various sizes. These patches not unfrequently become chalky or bony, cause the superincumbent membrane to disappear, and project rough and scabrous into the interior of the artery. In this state of things, the semilunar valves at the mouth of the aorta are generally more or less diseased, although not necessarily to such an extent, as either to occasion obstruction, or admit of regurgitation of the blood. Circumscribed dilatation, whether of the aorta or of the large arteries which arise from its arch, is commonly called aneurism; it varies much in degree in different cases, it may be very considerable or it may be such as to form a tumour as large as a walnut or an apple, or it may protrude through the ribs, and attain the size of a child's head.

The signs and symptoms of *diffused dilatation* of the aorta and larger arteries are often extremely obscure, especially at an early period of the disease; the first perceptible indications are, probably, some degree of shortness of breath, and occasional palpitation, especially on exertion, with a sallow paleness of the countenance. When more advanced, we can sometimes discover, by gently forcing the finger into the hollow behind the top of the sternum, that the pulsation of the arch of the aorta can be more distinctly felt than usual, whilst the size and throbbing of the innominate and carotids not unfrequently render their dilated condition sufficiently obvious both to the sight and touch. At this time, or at a still more advanced stage, a distinct harsh bruit or murmur may often be detected in the course of the dilated vessel on each contraction of the ventricles, the shortness of breath becomes strongly marked, the patient experiences frequent attacks of throbbing, pain or giddiness in the head, or now and then a momentary loss of recollection, we pro-

bably observe slight œdema of the lower limbs, or a puffiness beneath the eyes; and the pulse, although perhaps regular, very commonly communicates to the finger the peculiar jerking or splashing sensation so characteristic of most of the chronic diseases of the heart and large vessels: indeed, with due attention to the possibility of such a pulse arising from merely excessive irritability of the heart, from profuse or protracted hæmorrhage, chlorosis, or other cause of anæmia, it may very fairly be regarded as one of the most valuable diagnostic signs of these organic affections.

When the dilatation is *circumscribed*, constituting aneurism, its most frequent seat is the arch of the aorta; nevertheless it is by no means uncommon in the ascending aorta, in the innominata, and left subclavian.

The signs and symptoms of aneurism of the aorta, vary according to its seat, and according to the degree and extent of the dilatation. At a very early period, little or no inconvenience appears to be felt by the patient, and even when more advanced, the symptoms complained of are for the most part so extremely obscure as greatly to perplex the practitioner. Some slight shortness of breath on exertion, transient palpitation, or other irregularity of the heart's action, a faintly perceptible jerk in the beat of the pulse, and certain vague and anomalous pains within the chest, are probably all that we can detect after the most careful investigation; and hence, if suspicion be roused at all, it is rather by the recollection of some former difficulty or mistake, and by the absence of other appreciable sources of disturbance, than by any positive evidence derived from the symptoms present. It is true that, on listening attentively to the chest, about the region of the heart and large vessels, we occasionally perceive a bruit more or less distinct at each contraction of the ventricle, but this is far

from being a constant sign even when the disease is considerably advanced. When, however, the aneurismal swelling is such as to cause injurious pressure upon the neighbouring parts, and interrupt the functions of particular organs, our apprehensions are much more likely to be awakened; and if we find the heart's action greatly disturbed, without our being able to trace it to any decided disease of the organ itself, or to sympathy with disease in other parts; if we observe the flow of blood passing to the descending cava to be much obstructed; if we have indications of pressure upon the trachea and bronchi, or upon the pneumogastric or recurrent nerve, producing hoarseness and feebleness of the voice, croupy cough and respiration, or symptoms of spasmodic asthma or of spasm of the glottis; if there be anomalous symptoms of bronchitis, pneumonia, or hæmoptysis; if deglutition be painful, or so difficult that the patient is under the necessity of making a double effort before the morsel will descend into the stomach; and if he complain of vague or severe rheumatic, lancinating or grinding pains about the back of the neck, in the upper extremities, or shooting from the sternum to the sides, and towards the back; the existence of an aneurism becomes more than probable. When, at length, in consequence of the absorption of the intervening bone or cartilage, a pulsatory tumour makes its appearance externally, little doubt will remain as to the real nature of the case; for although glandular, fungoid, or other tumours, situated over the larger vessels, and more rarely, an abscess or morbid growth in the anterior mediastinum, might possibly mislead, such cases are very uncommon, and when they do occur, a careful review of the progress of the case will seldom fail to decide the question easily enough. Of course the site of the tumour will depend upon the situation and direction of the arterial dilatation; when the

ascending aorta is dilated close to the semilunar valves, the heart is occasionally displaced, and the tumour projects on the left side, exactly in the region naturally occupied by that organ. Much more frequently, aneurism of the aorta causes absorption of the upper part of the sternum, and of the cartilages of the second, third, and fourth ribs of the right side; or when the *arteria innominata* is affected, we have the tumour rising behind and above the clavicle.

As regards the bruit, said to be present in aneurism of the aorta, it has already been observed that when the dilated part is deep seated, we often fail to detect it; but when the tumour presents itself externally, we have generally observed that at first, the bruit is heard at each contraction of the ventricle, and at that time only; that at a later period or when the tumour is larger, a double bruit or see-saw sound is often heard; but that when the tumour gets very large,—when the dilatation of the artery is such that its elasticity appears to be completely destroyed, there is either no bruit at all, or it is only heard as before, during the contraction of the ventricles.

As regards the *causes* of dilatation of the aorta, some persons manifest a strong predisposition to aneurism, even at a comparatively early period of life. In general, however, both the diffused and circumscribed forms of dilatation are most frequently met with between the ages of forty and sixty, although either form may be induced at an earlier period in those whose occupations subject them to violent bodily exertion, and especially if they are in the habit of lifting heavy weights. Under such circumstances, dilatation appears in most instances to be gradually and slowly induced; in some rare cases, however, individuals have declared themselves able to specify, from an internal sensation experienced at the moment, the par-

ticular occasion on which a sudden strain or effort had laid the foundation of the disease. The diffused, and perhaps also the circumscribed dilatation may be produced by original hypertrophy of the heart; whilst on the other hand, it would appear that original disease in the arteries not unfrequently leads to hypertrophy and dilatation of a part or the whole of the heart.

The *treatment* can be little more than palliative, and consists in the observance of great quiet, both of body and mind, removing all sources of excitement of the circulation, carefully avoiding exposure to the ordinary causes of disease within the chest, employing a spare and bland diet, and abstracting a moderate quantity of blood from time to time, according to the degree of plethora present. With these general measures, some have recommended the application of ice to the external tumour, with a view to promote coagulation of the contained blood, and thereby assist in bringing about a natural cure; a result perhaps possible, but nevertheless extremely improbable in any case.

As it is altogether incompatible with the limits of an elementary work, to enter into details respecting the several organic lesions, and congenital malformations of the heart occasionally met with, it must suffice to observe, that when the coronary arteries become ossified, which is not very unfrequent, the patient is liable to suffer from attacks of that distressing and often fatal complaint called *angina pectoris*; and that when from congenital malformation or from any other cause, a direct communication is established between the right and left sides of the heart, it very commonly gives rise to that livid dingy or blue state of the general surface, and of the face and lips in particular, to which the name of *morbus cœruleus* or blue disease has been applied.

PHRENITIS.

By the term PHRENITIS is understood an inflammation of the brain and its membranes. When the inflammation is supposed to be confined to the former, the term *Cerebritis*; and when to the latter, *Arachnitis* has been very commonly applied. The symptoms, however, arising from the affection of these different parts run into each other; and even if they were in themselves distinct, still their almost necessary combination in most cases, and the easy transition from one to the other, owing to the proximity and intricate connexion of parts, would produce an intermixture of symptoms, such as in practice could scarcely admit of separation. Some authors have even gone so far as to consider the term *Arachnitis* too general, and have adopted the still more exclusive appellation of *Piitis*, when the pia mater has been the presumed seat of inflammation. But if there be difficulty in distinguishing between the inflammation of the brain and its membranes generally, still less can we be expected to point out with accuracy the symptoms which bespeak inflammation of one or the other portion of the arachnoid or the pia mater: indeed the cerebral portion of the arachnoid and the pia mater are so closely united, that one can rarely suffer inflammation without implicating the other. For practical purposes, inflammation of the membranes of the brain may with propriety be treated of under the term

ARACHNITIS.

The most acute form of phrenitic disease is generally dependent upon inflammation of the membranes; and when idiopathic, it is usually the pia mater, and that part of the arachnoid which covers the brain, which are involved; while the arachnoid lining the dura mater suffers more particularly

when the inflammation arises from injuries or disease set up in the bones of the cranium.

The *symptoms* of acute inflammation of the membranes are rigors and general febrile disturbance, intense headache, suffusion of the eyes, intolerance of light and sound, pulsatory or other sounds within the head—sharp, quick pulse—quick, hurried, and altered mode of speech and action—furious delirium, convulsion, and coma.

But while these may be stated as the general symptoms of the confirmed disease, it must be remembered that it varies much in the mode of its approach, as well as in the intensity of its progressive stages. Sometimes the most unequivocal symptoms at once develop themselves; but more frequently several days of general uneasiness, such as belong to many febrile and inflammatory affections, precede the more decided symptoms; and to this are added a dull heaviness of the head, a weary aching of the eyes, occasional shiverings, a loss of appetite, and a feeling of nausea, often succeeded by sickness and vomiting; the urine scanty and high-coloured; the bowels constipated; the pulse generally quick, yet variable in frequency as well as in strength.

Such symptoms, although they mark inflammation already commenced and making decided progress, may be considered the first stage of Arachnitis; and in reference to the more severe symptoms about to follow, may be viewed as precursory; and having continued for an uncertain time, a few days or a few hours, the dull heaviness of the head gives way to an intense pain, and the conjunctiva becomes injected with innumerable minute vessels, producing the appearance called the ferrety eye. As long as the patient is able to explain his feelings, and is not led by the confusion of his mind to neglect or forcibly resist his

bodily sufferings, he shows distinctly an aversion to all loud noises or strong light; and expresses, when asked, in the most decided terms, the violence of his headache, and the harassing sounds within his throbbing temples. His pulse is sharp, quick, and hard, but even now is subject to occasional more deceptive variations—the skin is hot and dry, but occasionally bursts into perspiration; and this is sometimes even profuse. The tongue is white and parched, with red tip and edges; and when shown, is protruded with unnatural vigour, or is observed to quiver and vibratc. The manner of the patient is flighty and inconstant; he sometimes bursts into paroxysms of violence—sometimes falls into a drowsy state; but natural and sound sleep are altogether wanting. The state of excitement and delirium continues and increases, till, after a very few days, this second stage gives way, either suddenly or by slow degrees, to the exhaustion of the third stage, when the pulse permanently loses its power. The raving delirium is succeeded by a still less healthful condition of the mind, which becomes lost in confusion, and the patient lies in a state of unconscious prostration, his tongue dry, brown, and chapped, his teeth loaded with sordes; the face, the eyes, and the hands begin to show spasmodic twitchings; severe convulsions presently affect the whole body, and a state of coma, for a few hours, precedes the dissolution.

Morbid Appearances.—The morbid appearances vary according to the continuance of the disease, its severity, and the part chiefly affected. In genuine Arachnitis, where the arachnoid covering the brain and the pia-mater have been the seat of inflammation, increased vascularity may be the only deviation from health observable. This is sometimes general, sometimes in patches, or sometimes occupies one hemisphere. Unless the vascularity be in a very marked or excessive degree, it is always open to some doubt; as the

position in which the head has been placed soon after death, or the circumstances of the last moments of life, may influence the injection of the vessels ; but where we not only find the larger vessels filled, but the smaller ones much more numerous than usual ; and still more when we find in any portion of the membranes some of the more decided products of inflammatory action ; the vascularity becomes a more important and undoubted indication of the extent of that action. In some instances of unusually intense vascularity, without the occurrence of other proofs of acute inflammation, the action has been of a more chronic character.

Other proofs of the early stages of acute inflammation are derived from unusual dryness of the surface of the arachnoid, or a peculiar unctuous condition of the secretion, and an unnatural softness or friability of the membrane ; so that it is with difficulty taken from the brain without tearing. As the inflammation advances, serous effusion is seen filling the spaces between the convolutions, and apparently penetrating the structure of the pia mater as it dips into the fissures. The membranes themselves become thicker and firmer than natural, and opaque spots are seen following the course of the larger vessels. These changes are frequently more observable at the base of the brain, about the cerebellum and the pons Varolii, or around the optic nerves, than on the surface of the hemispheres ; and on these parts they often produce a gelatinous appearance, which, however, is deceptive, as the fluid has seldom acquired any unusual consistence, but escapes slowly, owing to the loose cellular tissue in which it is there collected being somewhat increased and thickened by inflammation. The same changes, both in the character of the secretion, and in the tenacity or density of the membrane, are also observable throughout the ventricles.

With regard to these appearances, it may be observed,

that generally, in proportion as the effusion is greater on the surface of the hemispheres, and more especially in the ventricles, coma and cerebral depression have marked the concluding periods of life; whereas, when convulsive action has prevailed, the collection of fluid and the evidences of inflammation are greater at the base.

It occasionally happens that the character of the effusion beneath the arachnoid is completely changed: it becomes opaque, of a straw colour, and is apparently pus; and when the arachnoid and pia mater are raised from the brain, this is raised with it amongst the meshes of the pia mater, by which membrane it seems evidently to have been formed. Although this is occasionally discovered as the result of idiopathic inflammation, it is more often the consequence of some mechanical injury, as blows and fractures of the basis. Where pus is found upon the surface of the arachnoid, the mischief may likewise generally be traced to disease of the cranium and dura mater.

In the progress of Arachnitis, the surface of the brain itself necessarily becomes involved; the vascularity of the cineritious substance is increased, and its texture is softened; and this frequently in a very appreciable degree.

The *Diagnosis* in this disease is most important, and at the same time most perplexing. The three diseases from which it is most difficult to distinguish Arachnitis, are fever, acute mania, and delirium tremens; and this difficulty is the greater, because each of these diseases is not unfrequently accompanied by some modification of inflammatory action in the membranes of the brain; so that each of them may pass, by almost insensible gradations, into true Arachnitis.

The cerebral affection in *fever* is generally marked by much more evidence of oppression than the delirium of Arachnitis—fierce and active delirium rarely occur in fever,

unless the membranes are taking on the inflammatory action. The general history and progress of the disease, the comparatively soft and yielding pulse, the real prostration of the vital energies, and the peculiar expression which seldom fails to attend continued fever, all serve to assist our diagnosis; while the peculiar symptoms which happen to mark the prevailing fever of the period, the irritable bowels at one time, the exanthematous eruptions at another, furnish, in many cases, still further diagnostic marks.

In *acute mania* the evidence of mental disturbance greatly outweighs that of bodily disease, which is often but trifling, except as regards the derangement, of a greater or less continuance, of the digestive organs; and throughout the attack the tendency to take on the form of paroxysms of excitement, alternating with periods of comparative tranquillity, is much more marked; while the pulse, though it corresponds in some degree to these changes, seldom deviates so much from the natural standard, either in regard to quickness, to inequality, or to hardness, as it does in Arachnitis.

In *Delirium tremens*, the softness of the pulse, often approaching to feebleness—the open and perspirable state of the skin—the peculiar character of the delirium, in which even acts of violence appear the result of apprehension and suspicion rather than of any other mental condition—will be circumstances on which our diagnosis may be founded.

The *exciting causes* of Arachnitis are, mental excitement and anxiety—exposure to the vicissitudes of temperature—the intemperate use of spirituous liquors—external injuries, and diseases taking place in the bony structure of the head; besides which, it not unfrequently arises in connexion with other affections of the system, as fevers, delirium tremens, rheumatism, and the exanthematous diseases.

Prognosis.—The prognosis in this disease, unless seen and

detected in its first stages, is very unfavourable ; whereas if early recognised and treated with energy, the disease is generally removed, but is apt to leave some weakness of mind or susceptibility of body, requiring much care for many months. The more favourable indications are a cessation of the local with a proportional diminution of the general symptoms. The circumstance which portends a bad result, is the advance of the disease, in spite of remedies, to that condition which has been pointed out as marking the second and third stages of Arachnitis ; whilst the more the symptoms bespeak great prostration, or lead us, by the indications of lethargy, coma, and convulsions, or involuntary discharge of urine or fæces, to a belief that effusion is taking place, the less can we encourage hope.

Treatment.—Where an organ so important to life as the brain or its appendages is involved in inflammation, the most active means should be adopted ; and the moment that we have satisfactorily ascertained the existence of the disease, or even arrived at a tolerable certainty that the symptoms bespeak its approach, we must have recourse to free bleeding from the arm, so as to affect the general system as indicated by the pulse ; and to active purging, for which purpose, five grains of calomel, and ten of colocynth, may be given, followed by the senna draught, repeated till the bowels are effectually cleared ; or if, from the difficulty which the diagnosis often presents, we have considerable doubt how far the symptoms may be referable to the commencement of fever or of delirium tremens, we may at first try the effect of the purgative alone, and watch the symptoms for a few hours before we have recourse to the free abstraction of blood. Time, however, must not be lost : the bleeding must be performed, and repeated after a short interval, and must be again repeated according to circumstances ; and calomel

and antimony must be administered in frequent doses—two grains of calomel, with a quarter or sixth of a grain of the antimonii potassio tartras being given every third or fourth hour; and should this be found to run off by the bowels, the hydrarg. c. cretâ., in four-grain doses, with chalk mixture or a few grains of the pulvis ipccacuanhæ compositus, may be substituted; or a small quantity of opium may be added: though, upon the whole, it is better, in every instance, to avoid opium as much as possible where the brain is the seat of vascular disease.

The head should be shaved, and kept cool with ice or evaporating lotions, whilst all noises, and every external source of excitement, should be carefully avoided. As the symptoms recede or moderate in their violence, cupping from the nape of the neck, and leeches to the temples, will serve to keep down the inflammation; their repetition being determined by the general evidence of remaining power.

When as much has been done as prudence will allow, or as the symptoms authorize, by these more direct methods of depletion, if the symptoms still continue, mercurial remedies must be persisted in till the constitution is brought completely under their influence; and with this view a drachm of the mercurial ointment may be rubbed on the insides of the arms and thighs two or three times a day, and such forms of mercury given internally as will not disturb the bowels.

In this stage of the disease, blisters will be very useful, and may be applied between the shoulders, to the nape of the neck, behind the ears, or even to the scalp itself; and if there have been difficulty in affecting the system with mercury, the blistered surfaces may be dressed with the mercurial ointment.

At this more advanced stage of the disease, great care

should be taken to prevent the remaining strength of the patient from being exhausted, which must be done by mild nutriment and a cautious regulation of the bowels ; for should diarrhœa come on, he will rapidly sink. It may be necessary, even while the mercurial treatment is adopted, whether with a view of subduing low inflammatory action, or of favouring absorption, to have recourse to a certain quantity of stimulus, more particularly to ammonia in its different forms. The sesqui-carbonate of ammonia in excess, in a state of effervescence, with citric acid or lemon juice, will be grateful to the stomach, if sickness or nausea be experienced, or the ammonia may be given in the infusion of serpentary.

When the symptoms have gradually subsided, the most careful management will long be necessary to regulate the diet and avoid every excitement ; for not only have we to fear relapse, but to dread lest some marked change should have taken place in the brain which may lead to a permanent diminution of the mental energy.

INSIDIOUS ARACHNITIS.

Besides the acute arachnitis which has just been described, there is a more slow and insidious form of the disease, which gradually creeps on, and is apt to make considerable advance before its real character is at all suspected. It begins by uneasy sensations over the whole body, pains in the limbs, slight headache and chills, loss of appetite and nausea, or even vomiting ; and then for many days a sense of general illness only, with some degree of cerebral oppression, unattended by severe symptoms, but rendering the patient unfit for his ordinary avocations. This condition may continue for two or three weeks, varying from day to day, till the more decided symptoms of cerebral mischief, intense headache, frequent vomiting, and perverted sensa-

tions, are gradually developed, and a protracted state of disease terminates, in slow effusion into the meshes of the pia mater or into the ventricles of the brain, indicated by a state of coma and subsultus,—or in the effusion of a more decidedly albuminous nature, spread over the arachnoid lining the dura mater, or the serous surface of that situated over the hemispheres. The mind of the practitioner should always be on the alert to watch and appreciate symptoms of this insidious kind; and they must be met by some general depletion in the commencement, by local depletion, by counter-irritation, and above all by the action of mercury.

The membranes of the brain are subject to a still more slow effusion of serum, depending generally on derangement of the circulation, and gradual changes either in the heart and large vessels, or in the more distant organs; but this effusion cannot be considered the result of inflammatory action, nor is it frequently accompanied by that state, and will be more properly considered amongst the causes producing pressure and paralysis.

CEREBRITIS.

CEREBRITIS is the term used to express the inflammation of the substance of the brain. The symptoms by which it is marked are usually much more obscure than those which attend inflammation of the membranes. It is seldom met with in its acute form, except as an extension of Arachnitis, or as the result of injuries and previous changes or deposits in the brain; occasionally, however, no such antecedent disease can be traced. It presents many of the symptoms observable in Arachnitis, but is almost always less violent in its attack: it is often accompanied by little or no acute pain, but rather by a dull headache; occasionally, however, the pain is severe, especially if the inflammation involves the membranes. Cerebritis is more apt, likewise,

to affect the sensations of distant parts, producing feelings of numbness, formication, distressing pains in the limbs, and sometimes cramps and spasmodic twitchings; it also sometimes affects the senses of sight and hearing. As it often follows upon some previous disease, its approach is frequently very insidious; the symptoms more peculiarly belonging to it being gradually added to those which had before existed. In the early stages, whether the disease be primary, or attendant upon previous chronic disease, it is marked by occasional headache, slight vertigo, nausea, a furred tongue, depression of spirits, and an accelerated pulse; with these are associated wearing pains about the shoulders and arms, and subsequently, those derangements of the nerves of sense and motion to which reference has just been made. The whole disease, in various periods of its advance, assumes much of the character of fever, but at no time is this so marked as when it gradually draws towards its fatal conclusion; at which time, the general depression of the system, the dry brown tongue, the sordes covering the teeth, and the general loss of mental as well as bodily energy, give it almost all the characters of protracted fever.

Morbid Appearances in Cerebritis.—In the early stage of this disease the only appearance presented is increased vascularity, which occurs either in the cineritious portion, which throughout the whole or in a certain layer of its thickness assumes a rose colour, or over the whole medullary matter when a section is made, or more frequently in circumscribed spots in the substance. The vascularity is of a lighter colour, and there is more tendency to some change of consistence in the vascular part than when a somewhat similar appearance is produced by simple congestion. The inflamed part at this early stage is generally rather firmer and more

resisting than the surrounding brain; but as the inflammation advances the diseased portion soon becomes softer, gradually losing its consistence, and changing into a pulplike and almost fluid state, to a certain degree discoloured by admixture of blood either diffused or in small elots. Oeeasionally this disintegrated portion is more or less mingled with pus, or is almost entirely converted into it. Sometimes, and especially in the more aeute attaeks, no perceptible effort has taken place to insulate the diseased portion by the formation of a cyst, but when the inflammation has advanced more slowly, we frequently find a very distinct, and sometimes a remarkably firm eyst, whose parietes are more or less vaseular, and in these cases the contents of the cyst become completely puriform, or assume a peeuliar tenacious mueopurulent appearance. But while the softening and disintegration of the brain is the more general result of aeute inflammatory action, yet in subdued forms of inflammation a contrary effect is often produced, and portions of small extent will be discovered either deep in the substance of the brain, or involving the convolutions where a very manifest hardness has been the sequel of inflammation, rendered more unequivocal in some instances by the firm adhesion of the membranes at the indurated part. These products of inflammation, but more particularly the diffused softening, and disintegration, are often found surrounding some tumour or deposit which has lain inactive and perhaps undiscovered till the inflammatory action has been set up.

The *exciting causes* of Cerebritis are occasionally such as influence the circulation of the brain through the operation of the mind, when it is strongly excited or long and intently coneentrated on any object, or such as operate on the circulation by deranging the general health; but much more frequently the brain is inflamed through extension of

inflammatory action from the arachnoid; or the inflammation originates in the irritation occasioned by previous disease and disorganization, connected with injuries and blows producing concussion and laceration of the brain,—or inflammation and suppuration within the tympanum,—or tumours which are sometimes malignant, and very frequently scrophulous in their nature, give rise to the disease.

Diagnosis.—In the commencement of the disease it may be easily mistaken for Dyspepsia. In its progress it has occasionally been considered as Rheumatism, and in its advanced stages it bears a strong resemblance to idiopathic fever; so that there is danger in the first place of being led away entirely from the seat of disease, and in the second, there is some difficulty, when it is once fully ascertained that the head is the seat of inflammatory action, to decide how far the brain, and how far the membranes, more immediately suffer. With regard to the mistakes into which the peculiar pain in the limbs, particularly in the arms and shoulders, and the dull pain in the head, are apt to betray the practitioner, it is by the absence of all local swelling and inflammation in the parts, and by the concomitant symptoms of cerebral irritation, that the error will sooner or later be corrected.

Cerebritis is to be distinguished from *Dyspepsia* by the absence of precordial and abdominal pain, and of those derangements of the bowels which usually accompany that disease; also by the more decided reference of complaint to the head, and particularly that tendency to spasmodic action and to faulty perception, which early displays itself if the brain is seriously affected.

The preceding circumstances of the history, the absence of the true febrile depression and aspect, and the course of the disease, will not permit the attentive observer to entertain long the idea that the patient is labouring under

idiopathic *fever*; and fortunately the distinction is most striking in the early stages of the disease, when the error would be most injurious: in the more advanced periods, when the time for active treatment is passed, and a state of almost hopeless depression is arrived, the nosological distinctions are of less importance.

From *Arachnitis* it will be distinguished by the much lower degree of mental excitement, the different character of the pain, and the greater disturbance in the nerves of sensation and of voluntary motion, as well as by its general progress.

The *prognosis* is most unfavourable, and unless seen and actively treated at the very commencement, there is little chance of preventing such serious injury of the brain as will be nearly if not quite irreparable: at the same time it sometimes happens that the parts assume such a condition by the formation of an organized cyst around the destroyed portion, that the present immediate risk of life is removed, and it is probable that life may be prolonged for a very considerable time.

Treatment.—In the treatment of Cerebritis the most active depletion is called for, if we have been fortunate enough in its earliest stages to ascertain its existence, as may often be the case when it arises from known injuries of the brain or from long-suspected chronic change. Nothing short of large bleedings from the arm will meet the circumstances of such a case, and leeches must again and again be applied as near to the seat of pain as is practicable. Cupping-glasses must also be used to take blood from the neighbourhood of the head, and this depletion must be seconded by strict attention to the bowels, and the use of calomel as a purge. Blisters to the nape of the neck and sinapisms to distant parts will probably be of use. Diaphoretics and purgatives must not be overlooked. The diet must be very low,

and the strictest attention must be paid to withdraw every source of excitement or disturbance, both mental and corporeal. If by such remedies the symptoms are cut short, a long course of attentive nursing will be requisite before the patient can be trusted to meet the usual cares of life.

CHRONIC CHANGES IN THE BRAIN.

The Brain is subject to many changes of a chronic character, which are the result of morbid actions more or less inflammatory in their nature, and which, though in themselves scarcely to be classed with the *Phlegmasiæ*, become the frequent source of secondary *Cerebritis*. Amongst these are chronic changes in the structure of the brain, the substance of which becomes harder or softer in particular parts by a process probably strictly allied to inflammation; also deposits of the nature of scrophulous tubercles and the development of different forms of malignant disease; also bony deposits and hydatids.

When any of these or other similar changes have taken place in the brain, the morbid state is frequently indicated by pain in the head, sometimes the most intense, yet generally intermitting; and as the progress of such disease is for the most part slow, and the intervals of ease are often long, we are apt to flatter ourselves that the pains arise from functional derangement alone, and sometimes the headache will in a great degree have subsided before other symptoms of a less painful but of a more unequivocal character arise; at other times with the pain various indications are associated. Sometimes the pain bears but a very small proportion to the other symptoms, which then vary greatly, chiefly affecting the functions of the different senses, and often inducing convulsive action. Thus, for instance, the sight may become permanently impaired, or for a few minutes or hours partially obscured; only a portion of the

object looked at may be seen, or the object may be doubled: the hearing in one or both ears may be diminished, or impressions may be produced not depending on external sounds: the taste or the smell may be rendered obtuse or vitiated, or some particular portion of the body may lose its common sensibility: convulsive actions may take place in some small portion of the body, or decided epilepsy may be induced: and though the cause of all these symptoms is fixed and increasing, yet the symptoms are generally transient, and in a remarkable degree capable of variation and interruption. As these chronic diseases increase, the mind gradually suffers, the memory becomes defective, the power of fixing the attention lost, and a state approaching to imbecility may in extreme cases be observed.

The most common *exciting causes* of chronic changes and tumours within the brain are blows and falls, which, more particularly where the tubercular diathesis prevails, often lay the foundation for that chronic action on which the development of tubercular growth depends; and if such tendency does not exist, still the violence may be so great as materially to injure or lacerate the brain, and thus prove a commencement of important structural change.

Treatment of Chronic Changes in the Brain.—When changes of this nature are suspected, we should endeavour by every means in our power to diminish the local action without injuring the powers of the system, which it will be more particularly desirable to maintain in that condition of the body which favours tubercular or scrophulous deposits.

We have a double object in view: first, to retard the progress of the presumed morbid change or growth, and secondly, to prevent the attack and progress of that inflammatory action in the surrounding parts which is constantly to be feared. With regard to the first of these objects, it will be necessary carefully to avoid excitement, not

only such as under circumstances of health would be considered excessive, but even the excitement which arises from the ordinary avocations of life. All exciting conversation, all mixed society, all places of public amusement, and all social entertainment should be sedulously avoided, and everything which through the operation either of the body or the mind can induce over action or turgescence of the vessels of the brain: besides which, when the supposed disorganization is of a strumous character, all those measures are to be adopted which serve to strengthen the system, through the united influence of fresh and wholesome air, moderate exercise, and a mild generous diet.

When inflammation has begun to show itself, or there is any evidence of action being set up in or about the chronic disease, this must be met by leeches and cupping, or even if acute by general bleeding. Brisk purging, and blisters to the nape of the neck and temples, with other means of counter-irritation both near the head and in distant parts, and frequently repeated dry cupping will be of service. Cold should be assiduously applied to the head, and all the precautions adopted which serve to prevent cerebral excitement.

OTITIS.

OTITIS is an inflammation of the organ of hearing in any of its parts. The symptoms are pyrexia, and intense pain in the ear, extending over the head and face, with redness and swelling, observable in the meatus, but also invading the internal organ. This inflammation sometimes ends in resolution, but often goes on to suppuration, and not unfrequently passes into a chronic state, attended by discharge, which continues at intervals during many years. The acute form of this disease is marked by the most intense and agonizing pain, owing probably to the unyield-

ing nature of the parts in which the inflamed tissues are imbedded: this pain often continues for some days, suffering aggravation and diminution according to the state of the circulation, and frequently becoming worse as the evening approaches: during this period of the disease the meatus is almost closed, and the sense of hearing is nearly lost. If resolution take place the alleviation of the pain is gradual, but if the disease goes on to suppuration, the discharge of a few drops of pus is followed by instantaneous relief; and although fresh formations of pus not unfrequently occur, yet the disease soon subsides: in other cases, however, more particularly when the inflammation has been the result of some weakening disease, as scarlatina, other structures in the meatus besides the cellular tissue appear to be affected, and the glands become so much deranged that their secretion is rendered acrid and altered in such a degree as to keep up a constant irritation in the part, which continues for years. This discharge either at length subsides, or by its constant irritation affects the deeper structures, often goes on to ulceration, and destroys the membrana tympani, or communicates with the cavities of the petrous portion of the temporal bone; and under the influence of some aggravating circumstances produces inflammation of the membranes and suppuration of the brain itself.

Morbid appearance.—While the disease is confined to the external parts, there are few opportunities of examining the state of the lining membrane of the meatus, which is thickened and inflamed, with no doubt effusion into the scanty cellular membrane beneath it, and this effusion becoming purulent. As there is no possibility of this effusion dilating the bony canal in which it is contained, the lining membrane necessarily advances upon itself so as nearly to close the meatus.

When the disease has assumed the chronic form, we find the lining membrane thickened, granular, or ulcerated; the membrana tympani frequently ulcerated through, and the internal cavity of the ear filled with an unhealthy puriform matter, sometimes of the thickness of curd, in which occasionally, although the tympanum has been destroyed, we find the bones of the ear still imbedded. All the cavities and canals of the ear are often filled with the same unhealthy secretion, which likewise pervades the cancellated structure of the surrounding bone. A small perforation is probably next found in the internal plate of the bone, from which, as from a centre, inflammation has attacked the dura mater, which is affected over a greater or less extent: sometimes a layer of pus separates a portion of the membrane from the bone; sometimes the membrane is in a state approaching to gangrene: perhaps only a small spot on the external surface of the brain and of the arachnoid shows marks of disease; but on cutting into the brain at that spot, which is generally in the middle lobe, a suppurating portion, sometimes of very large extent, is found. These appearances, however, which bespeak the destruction of a portion of the brain, vary much according to circumstances.

The *predisposing causes* are such as induce an inflammatory condition of the system; neglect of the bowels; and unwholesome modes of living, especially in persons of a strumous habit.

Exciting causes.—The most frequent exciting cause is exposure to cold, from currents of air striking on the ear, particularly when the body is heated by previous exercise; it is likewise occasionally the result of Cynanche, the inflammation extending itself along the Eustachian tube, and thus involving the internal structure of the ear. It also follows the excitement of some debilitating diseases, more particularly Scarlatina and Rubcola, in which the mucous and fol-

licular apparatus are strikingly involved; and not unfrequently it is a sequel of continued fever; in all which cases it often attacks both ears either together or in suecession.

Prognosis.—In the acute form of the discase, arising under ordinary states of the body, and when no particular cercbral derangement exists, very little danger is to be apprehended; but when the disease has assumed the chronic form, attended with otorrhœa, there is considerable ground for apprehension that sooner or later its extension inwards will involve the brain and its membranes in fatal mischief.

Treatment.—The indications of cure are to reduce inflammation, to allay pain, and to restore the natural tone and action to the parts which have been left weakened or deranged by the disease.

In the early part of the disease, therefore, while it is acute, the strictest antiphlogistic treatment is to be adopted. It is not very often necessary to have recourse to general bleeding, but in some cases this may be employed, although in general ten or fifteen leeches behind the ear may be substituted with advantage. Brisk purging is always desirable, first with a dose of calomel or blue pill, quickly followed by a senna mixture, and afterwards with the saline purgatives. The acuteness of the pain, defying all rest or sleep, often demands the aid of an opiate, in which case it should be combined with some diaphoretic, as for instance, eight, ten, twelve, or twenty minims, or more, of the liquor opii, or of the tinctura opii, according to the age and circumstances of the patient, with two or three drachms of liquor ammon. acet., and a scruple or half a drachm of the liquor antimon. potas. tart., taking care to obviate the constipating effect of the opiate by a purgative. While these remedies are being administered, warm local applications are to be assiduously employed, of which the poppy fomentation or a soft poultice are amongst the best.

When the acute disease has been removed, should a discharge continue from the ear, it is necessary to be very prompt with such measures as may remove it, for if allowed to go on, it will become habitual, and its cure will be almost impossible. For this purpose, blisters behind the ears, either repeated or kept open by the ceratum sabinæ, and astringent washes made with the sulphate of zinc or the vegetable astringents are often useful: or, should these fail, a solution of nitrate of silver, two or three grains to the ounce, applied to the meatus with a camel's hair pencil, may be tried. But all these means are frequently insufficient, and the constitution must be brought into a more healthy state by tonic remedies, by sarsaparilla, and by change of air; a preference being given to a sea-side residence. Sometimes a little alterative medicine, as a few grains of Plummer's pill to the adult, or a quarter of a grain of calomel, with two or three grains of dried soda and a few grains of chalk, to children, will much assist in overcoming this troublesome and even dangerous malady.

DELIRIUM TREMENS.

This term is applied to what appears to be, or is very closely allied to, a modification of Arachnitis, occurring in persons whose nervous system has been brought by various circumstances into a very irritable state. The symptoms by which it is chiefly indicated are, a state of delirium marked by some leading peculiarities, together with sleeplessness, tremors, and profuse perspiration. The attack is often preceded by a few days of uncomfortable and irritable feeling, so that there are instances of those who have been several times affected with it giving intimation to their family of the approaching paroxysm: but very frequently it comes on after a few hours of febrile irritation; the patient beginning to talk incoherently, to express sus-

pitions of something going on around him, some plots laid, or some designs harboured, in which it seldom happens that those who actually surround him are the persons implicated, for he usually fills his chamber with imaginary beings who attempt boldly to seize him, or lie in wait for him hidden beneath his bed or in a closet. His manner and actions mark alternately the greatest alarm and the most furious determination to resist or escape. In his most tranquil and collected moments he is not to be trusted, for the transition from that state to the greatest violence is instantaneous: he is often recalled by a word to an apparent state of reason, but as quickly his false impressions return: there is sometimes evidence at the time of a state of double consciousness, a condition of the mind which is sometimes remembered by the patient when the paroxysm is over, so that he relates the curious history of day dreams which have passed before him while he was still conscious of the presence of his friends.

The pulse is during all this commotion comparatively little influenced, or is accelerated and weak; the tongue sometimes covered with a dyspeptic fur, but more generally healthy or morbidly red: the appetite is gone, and perfect wakefulness is an almost constant attendant. All these symptoms may continue for some days, sometimes marked by greater violence, sometimes admitting of a broken conversation with those around; and it generally happens that the transition from disease to health is as sudden as the first appearance of the paroxysm had been, this change usually taking place in consequence of sleep procured by medicine, out of which the patient awakes perfectly restored.

The *diagnosis* of Delirium tremens has already been referred to when speaking of the marks by which Arachnitis may be distinguished from the delirium of fever, from acute

mania, and from this disease. It is chiefly in the history of the attack, the comparative softness of the pulse, the moisture of the tongue, the perspirable state of the skin, and the peculiarity of the mental derangement, that we trace the distinctive signs of Delirium tremens.

Causes of Delirium tremens.—The exciting causes of this disease are almost always connected with habitual intemperance, though this is sometimes so mingled with sources of mental annoyance or anxiety, as to give a colourable pretext for ascribing it to them. It very often happens that the immediate exciting cause is a sudden cessation from habitual intemperance; and not unfrequently the intemperance has for a few previous days been carried, by a kind of paroxysm, to a most unusual extent; and then, either in consequence of the direct excitement, or on a sudden cessation from the excitement, the disease almost suddenly betrays itself. It is occasionally induced by other causes in persons whose habits have predisposed them; and hence, it is not uncommon to see this form of delirium the result of large depletion by bleeding, which had been apparently rendered necessary by inflammatory attacks, hæmoptysis, or other diseases.

The *prognosis* must be very guarded, as it is always doubtful. A large majority however of these cases recover, if there is no very decided tendency to other disease in the brain, or great organic derangement in other parts; but ultimately the habits, on which the disease depends, destroy life, whilst some are cut off in the paroxysm itself, exhausted and worn out by its violence, or sometimes dying very unexpectedly by a kind of sudden collapse.

Treatment.—It is a question which at once presents itself in a disease marked by such manifest symptoms of excitement, how far we should attempt by depletion to make an impression on the system; and to an inexperienced person the decision would most probably be in favour of rather

active bleeding : it is therefore of the more importance that the student should have this question placed most prominently before him when speaking of Delirium tremens, and that the greatest caution should be inculcated in this respect. This is one of the strongest examples of that influence which the nervous system may be considered to exert in diseases more directly affecting the brain and nerves, whereby a certain irritation appears to augment those symptoms, which in some other cases might be wholly ascribed to inflammatory action : and the result of large depletion generally proves that the symptoms increase as the power of the system is diminished ; so that if led on by a wrong estimate of the phenomena, the practitioner may be betrayed into a repetition of measures which lead to a fatal issue. While it cannot be asserted that bleeding is never admissible in Delirium tremens, the general rule must certainly forbid its use ; and the occasional exceptions are, when the disease arises in persons of a very full or robust constitution, and when the origin of the attack can be plainly shown to connect itself with direct excitement. When, therefore, it is considered necessary to bleed, it should be followed by the administration of an opiate, as a grain or two grains of opium with a grain or two of calomel. The remedy, however, to which we look with greater confidence, and which can seldom be dispensed with, as forming part of the early treatment, is free purging. The disease generally takes place under circumstances very favourable to morbid accumulations in the intestines, and vitiated secretions both in them and the liver ; and we may always proceed on the impression that such is the case, exhibiting without fear a considerable dose of calomel and colocynt, followed by a warm senna mixture ; and as soon as this has had time to commence its action, a powerful dose of opium should be administered. Two grains of solid opium, or forty minims of the tincture of opium, may be first given ; and

this may be followed every hour by a grain of opium, to which a grain or two of calomel is advantageously added, till tranquillity or sound sleep is induced. At the same time, ammonia, in doses of five or six grains, or camphor to about the same extent, rubbed up in an emulsion, may be taken from time to time according to the state of the patient. It not unfrequently happens, that when the bowels have been freely opened, sleep is in a few hours induced, out of which the patient arises greatly relieved and refreshed, and sometimes even cured. It is, however, frequently a much more difficult task to bring about this most desirable remission of the symptoms; and many alternate administrations of purgatives, of opiates, and of stimulants, will in general be requisite. It may be found necessary to vary the stimulants; whilst in some instances a moderate quantity of the accustomed stimulus by which the disease may be considered as induced, will be found useful. Small quantities also of wine or spirit, or very often of porter, may be cautiously allowed; and if the least inclination is expressed for solid food, whether animal or farinaceous, this likewise may be given in small quantities with the best result. When there is much febrile action present, antimonial remedies are admissible; and two or three grains of the James' powder, or a quarter or eighth of a grain of the antim. potass. tart., may be occasionally combined with the opium.

It is desirable to use as little personal restraint as possible; but in many cases it becomes absolutely necessary to subject the patient to some form of confinement, both for his own safety and for that of the attendants; and to prevent the exhaustion which would arise from the constant struggles to which he would be exposed. Whenever such measures are unavoidable, they should be considered as a necessary evil, to be continued no longer and to no greater an extent than they are imperatively called for; but no vigilance can

be too great on the part of the attendants, who should never leave the patient for a moment.

When the paroxysm is over, we should try if possible to prevent its recurrence by correcting the bad habit on which it has depended. This, however, is unfortunately too often scarcely practicable; and the best we can then do is to inculcate care as to the state of the bowels, aiding them by the use of occasional mercurials, while we support the tone of the stomach by gentle tonics with ammonia, substituting these, if possible, for the more injurious stimulus of spirituous liquors.

ACUTE MANIA.

This term is applied to paroxysms of violent mental alienation not necessarily connected with inflammatory action within the cranium, nor with febrile disease.

The degree of obvious bodily ailment by which it is preceded, and even that by which it is accompanied, is often trifling, though occasionally very marked. Dyspeptic symptoms, and hepatic derangement, showing itself even by slight jaundice, have been present, for a period longer or shorter, generally for several days, sometimes for weeks. The manner of the patient has been changed, and peculiarities in the turn of his mind have been remarked by his family and friends; sometimes he has been observed to make extraordinary or ludicrous mistakes, or abruptly to take offence at his best and kindest friends without the slightest cause; has maintained strange paradoxes; has pursued some trifling object with most unreasonable eagerness; has expressed ungrounded fears respecting his worldly concerns, or most unaccustomed doubts respecting his spiritual condition. His manner has been such as to excite the surprise of those around him, but still he has in many things appeared so rational, and in his health has shown so little disorder, that no one has suspected the impending malady. In

a moment the paroxysm has come on, and furious mania has suddenly displayed itself by tremendous acts of violence, or perhaps some rash attempt at self-destruction. From this time all reason is lost, and nothing but force can restrain the unnatural strength with which he strives to carry out his furious but almost unconseious purposes. This state of violence is liable to constant changes, and subsides almost as rapidly as it has come on. At one time he is sullen and silent, refusing food; at another gay and talkative; but at all times, even when apparently most depressed, he is quick to take advantage of every opportunity to avoid the vigilance of his attendants. The pulse is generally quick, full, and compressible, and the tongue white, sometimes loaded, and in the advanced stages brown. The bowels are costive, and sleep is nearly absent; but on the whole the bodily derangement bears but little proportion to that of the mind. This state of alternate excitement and depression, with short intervals of apparent restoration, may continue for an indefinite time; but frequently in the more acute attacks, unless by treatment we succeed in moderating its violence, two or three weeks make a very sensible inroad on the constitution; and if the irritation be great, the patient often sinks exhausted. Should the disease lose something of its violent character, and longer intervals of improvement are procured, it may still gradually assume the form of fixed insanity; or a more fortunate result may take place, and perfect recovery may be established.

Predisposing Causes.—The strongest of these is some hereditary tendency, whilst the disposition is greatly encouraged by habitual neglect of moral restraint, by intemperance, and by inattention to the general condition of the health, more particularly by neglecting the digestive organs, including the liver.

Exciting Causes.—The most powerful exciting causes are

strong mental excitement of almost any kind, whether pleasurable or painful, and excess in any sensual indulgence, more particularly in drink.

Diagnosis.—The chief diseases from which it is necessary to distinguish acute mania are arachnitis and delirium tremens, both of which approach very nearly in many respects; but the principal points of difference have already been suggested when speaking of the diagnosis of arachnitis. The overwhelming mental disturbance, bearing no proportion to the bodily ailment, and the paroxysmal form which it assumes, may be considered its most striking diagnostic peculiarities.

Prognosis.—The termination of this disease is not unfrequently fatal where the paroxysm is very violent or of long continuance; but where intermissions and intervals of comparative tranquillity occur, the result is more favourable. Unfortunately, however, when it has once shown itself, there is no security from returns; and although it occasionally happens that no second paroxysm is experienced, yet the more frequent course of this disease is to return again and again, and to degenerate at last into incurable insanity; and the longer it has continued, and the more frequently it has recurred, the less is the chance of its removal.

Treatment.—When the excitement is very violent, on being first called, if the pulse be strong and the constitution uninjured, a single moderate bleeding may do good, cupping-glasses being afterwards applied to the nape of the neck, behind the ear, or to the temples, and a few ounces of blood being taken; but we must be very careful in the abstraction of blood, or, while we allay excitement, we shall assuredly produce so much depression that the patient will fall afterwards into a state of hopeless collapse. The head should be immediately shaved, and cold applied; and as in almost all cases the bowels will be found sluggish, or aet-

ing imperfectly, purgatives will be a very essential part of the early treatment. These must be such combinations of blue pill or calomel, with colocynth, scammony, or the compound gamboge pill, as will fairly unload the large intestines; and the action should be sustained by senna draughts or other purgatives. At the same time, divided doses of blue pill, as a grain or two, with or without some antimonial, may be repeated twice or thrice daily; and when the plethoric state of the constitution has for a day or two been somewhat reduced, if good sleep is not procured, recourse must be had to anodynes, as the tincture of hyoseyamus, in half drachm doses; the compound tincture of camphor, in doses of two drachms; or the muriate or acetate of morphia, in doses from a quarter of a grain to double that quantity, given at bed-time. The exhaustion which generally comes on early, but which often requires considerable care to detect, must be met by stimulating remedies; for often, when the paroxysms are still very violent, the state of the pulse will indicate a want of power. Camphor in substance or rubbed down with the almond emulsion, and combined with æther, or other similar remedies, will be very useful; and the ammonia with serpentaria, may be administered. Blisters to the nape of the neck or to the head, or sinapisms to the feet, may be also applied with benefit.

But while all these remedies are adopted, the most unremitting vigilance will be required, lest the patient should injure either himself or his attendants; and some degree of restraint, according to the circumstances, will be actually necessary; and the almost entire exclusion of those near friends whose sympathies might be strongly excited. Indeed, without this it will be impossible to exercise that control over the patient which is quite essential. At the same time, every unnecessary display of authority, and all undue harshness in treatment, will serve only to irritate him and

aggravate every symptom, as he can have but a very imperfect idea of the necessity of coercive measures; and in proportion as reason returns, personal restraint should be relaxed. The tonic treatment, and the occasional administration of mercury, in doses of a few grains at night, followed by gentle aperients, will be required for many weeks after the violence of the disease has passed away.

HYDROCEPHALUS ACUTUS.

When inflammatory action takes place in the membranes of the brain in children and young people, it is attended with a peculiar set of symptoms; and from the circumstance that serous effusion very generally occurs before the termination of the disease, becoming itself the cause of additional symptoms, this form of disease has acquired the name of *HYDROCEPHALUS*. To this name the term *ACUTUS* has been added, to distinguish it from a much more chronic form of serous effusion occasionally occurring in the cavities of the brain.

The approach of this disease is frequently very insidious, and its course protracted and various, still, however, retaining such a degree of constancy as to have led writers to admit a division of the symptoms into stages or periods, somewhat artificial, but not without its practical utility.

These periods we will for convenience consider as the period of approach,—the period of confirmed disease,—and the period in which it is probable that the results of inflammatory action are already produced upon the brain and its membranes. The symptoms of each period, but more particularly of the first, are likewise modified by the age of the patient; or, at all events, the symptoms if the same are not alike recognisable at all ages.

Symptoms of the first period.—This period varies in its

duration from three or four, to eight, ten, or fourteen days; and sometimes even for a still longer time, the precursory symptoms may be traced. In the adult, a state of lassitude and wandering pain in the limbs, loss of appetite, disinclination to business, disturbed and dreaming nights, pain in the head and in the muscles of the neck, noise in the ears, irregular rigors, occasional giddiness, nausea, and even sickness, deficient secretion of urine, and unhealthy appearance of the alvine evacuations, mark in various degrees the period of approach.

In infants the same symptoms appear to be present, but the means by which we judge of their existence differ. If children are arrived at an age when they are able to seek their own amusements, they are observed to lose their taste for such as formerly gave them pleasure; their little habits are changed; their activity is lost; and not only do they express fatigue and muscular pain, but are occasionally unsteady in their walk; they almost unconsciously shun the strong light, and shrink from loud noises; their appearance undergoes a remarkable and sometimes a rapid change, the look of health being quickly supplanted by the aspect of uneasiness and discontent; the appetite is gone, and the food is occasionally rejected from the stomach. Their nights are sleepless, or disturbed by dreaming, or interrupted by talking and screaming. The bowels are costive, the urine scanty, the pulse frequent, the breathing short, and interrupted by deep sighs. In very young infants in arms, it is observed that the head is frequently thrown back; at other times the head is hung down and droops, and the least sound alarms—which, in addition to the general change in appearance, and the defective evacuations, are important indications.

In some cases this first period is almost wanting; and the intense headache, and general symptoms of inflammatory

action, which usually characterize the second stage, succeed immediately to an apparent state of perfect health.

Symptoms of the second period.—The pain of the head is now very decided, and often intense; and there is a sensible heat perceived when the hand is applied to it; the carotids beat strongly: there is great restlessness, and intolerance of light. The pupils are often much contracted, and there is a knitting of the eye-brows: occasionally the pupils are somewhat dilated, and there is sometimes a tendency to strabismus. The hearing is peculiarly acute; the body emaciates rapidly; and though the bowels are obstinately constipated, the abdomen is flat, and sometimes drawn inwards. There is frequent vomiting, particularly when the patient is raised from the recumbent posture; urine scanty; pulse often slow and irregular, or intermitting. In children the colour of the cheeks is observed to change suddenly; at one moment suffused with a bright blush, and at another showing a deadly paleness. They evince likewise a restless desire to be moved when awake, and when sleeping they constantly moan, and grind their teeth. In this stage of the disease striking alternations are apt to take place; a day of comparative freedom from symptoms, frequently succeeding to one in which all the symptoms have been aggravated; and this will sometimes be repeated through several successive days, with the regularity, though not with the symptoms, of an intermittent fever. This period varies in the length of its duration from four to fourteen days.

Symptoms of the third period. The extreme restlessness seems, as this stage comes on, to give way to a state approaching to coma, interrupted occasionally by delirium, screaming, rolling of the head, the involuntary throwing about of the limbs, and unconscious picking of the nose and lips. The pupils are now generally dilated, rarely contracted; the sight is imperfect; the cornea is dim and

filmy,—the eyelids half closed;—strabismus,—double vision,—and ultimately insensibility to light—are discovered. The pulse is quickened; the teeth are ground together; spasms, and sometimes most severe and repeated convulsions, take place; the urine passes involuntarily; and frequently paralysis of one side, or of some portion of the body, becomes manifest for some hours or even days before the fatal termination ensues; an event which is generally preceded by some severe convulsive attacks.

There is occasionally, even in the most advanced stages of the disease, a temporary restoration of all the faculties to a very remarkable degree; and the condition of the patient might render the unwary practitioner inclined to augur favourably of the result; but in a few hours all the flattering symptoms again disappear, and the patient relapses into a state even worse than he was before. At other times, after all the faculties seem suspended or destroyed, the disease will be protracted for a most unexpected time; and the patient, from a condition in which death was confidently anticipated from hour to hour, will gradually and almost imperceptibly, or at other times more suddenly, pass into a state of convalescence, and recover.

Appearances after death.—These are sometimes confined to vascularity of the membranes, more or less marked, and occasionally with rather a deficiency than a redundancy of the serous secretion. More frequently, however, there is an effusion of clear and limpid fluid into the lateral ventricles, and the other cavities of the brain, varying from a few drachms to three or four ounces. The same effusion is observed between the arachnoid and the brain, and in a few rare instances externally to the portion of arachnoid which lies upon the brain. Occasionally the fluid is slightly opake, or contains flakes of lymph, or even of softened brain. The central portions of the brain in the neighbour-

hood of the ventricles are often soft; the septum lucidum and fornix quite destroyed; and the corpus callosum pulpy and disorganized. Besides these, which may be considered the results of the disease, other appearances are sometimes discovered, which seem to throw light upon the cause of the disease, or the state of constitution on which it depends, such as small scrofulous tumours and miliary deposits in the membranes which have been inflamed.

Predisposing Causes.—Hereditary predisposition is very strongly marked in this disease, so that it frequently happens that several children of the same family fall a sacrifice to it. There is little doubt, that the same combination, of a tendency to excessive action with weak natural power, which is marked in scrofula, is likewise connected with a predisposition to this disease; and in families so predisposed, it is generally the children of the most acute and intelligent minds who are most prone to the attack. The natural irritability, and the increased flow of blood towards the head in children, afford a constant predisposing cause to this disease.

Exciting Causes.—Whatever tends to derange the general circulation, and more particularly to excite the circulation in the head, especially in childhood and youth, may become an exciting cause. Thus infantile and exanthematous diseases, both in their course and in the state of debility which follows after them; exposure to undue vicissitudes of heat and cold; blows and falls; teething; neglect and irregularity of bowels; anxiety of mind; excessive study, and over-exertion of the tender faculties; all supply exciting causes of this disease.

Diagnosis.—In the commencement of Hydrocephalus it is very difficult to distinguish it in the adult from Hysteria as it affects the female, from Dyspepsia as it affects both sexes, and from other cerebral affections connected with

slow inflammatory action or disorganization; while with regard to children, the first and obscure symptoms of remittent fever often assume very much the character of the approaching period of Hydrocephalus. Still, however, sufficiently distinctive marks may generally be observed. In Dyspepsia the symptoms are milder, and more mingled with circumstances strictly referable to the stomach. In Hysteria the age and sex afford grounds for suspicion, and the constant succession of anomalous symptoms is forcibly contrasted with the regular and fixed progress of Hydrocephalus. There is in Hydrocephalus, in all sexes and ages, a much more distinct reference throughout the disease to the affections of the head, as shown by pain, giddiness, acuteness of hearing, deranged vision, and drowsiness. As respects children, the striking change in the appearance, and still more in the manner and disposition, the unquiet sleep, the peculiar slowness and irregular strength observed in the pulse as the disease goes on, the costive bowels without the tumid abdomen, the great deficiency in the secretion of the kidneys, all afford distinctive marks, and when combined present the means of a tolerably certain diagnosis. But with regard to some other affections of the brain, both in adults and in infants, there must always be the greatest difficulty in forming a distinct diagnosis in the early periods; for whatever may be the actual difference between the state of the vessels when the more decided symptoms of Phrenitis, or of cerebral inflammation excited by organic lesion and giving rise to other organic changes, exist, and that of the vessels in Hydrocephalus, there is no doubt that they trench so closely on each other that they mutually pass into each other, and appear to depend rather on the age and constitution of the patient than on any specific difference in the nature of the morbid action. In the advanced periods of the disease,

the affections of the sensorium and of the sight, the screams, the paralysis and the convulsions, present such diagnostic marks as can scarcely be mistaken.

Prognosis.—Our general prognosis in Hydrocephalus is very unfavourable, and the further the disease has advanced without having been checked by remedies, the less can we anticipate a favourable result. When the hereditary predisposition is strong, other children of the same family having been cut off by the disease, when serofula is known to exist in the family, and when the individual attacked is of a peculiarly irritable disposition of body and mind, we have great reason to fear. If, on the contrary, these circumstances are not marked, and if the disease can be traced to some accidental cause, more particularly if connected with teething or the state of the bowels, and still more if any improvement, continued through several days, is observable, our hopes of recovery will be greatly increased. There are few diseases in which we ought to be more guarded in our prognosis; for, as we have already observed, changes the most unexpected occasionally take place, suddenly destroying the hastily adopted hope of the inexperienced, or proving the favourable prognosis of the most experienced to be erroneous.

Treatment.—In the treatment of Hydrocephalus all our efforts are to be directed to the subduing of inflammatory action in the membranes of the brain, and the relieving of irritation either in the brain or in any other more distant part; while at the same time we bear in mind the tender age or the naturally feeble constitution in which this inflammatory disease is often set up. Bleeding, either general or local, free evacuations of the bowels, the assiduous application of cold to the scalp, mercury used to produce its specific effect on the constitution, blisters to the nape of the neck, or to other parts of the body, diaphoretic reme-

dies, but still more diuretics, and the different forms of opium and sedatives, are all remedies to which in various combinations we must have recourse.

On the activity of the treatment in the earliest stages, the favourable result will in a great measure depend. As soon as from the various symptoms we have detailed, even a well-grounded suspicion of the disease has been raised, blood should be taken freely from the arm, if the patient be past the age of childhood. An active calomel purge, followed by a senna draught, should be administered; the head should be shaved, and an evaporating wash, or a bladder partially filled with small pieces of ice, should be applied to the scalp, and assiduously repeated; by some physicians the cold affusion has been used; perfect quiet and rest should be enjoined, all strong light and every noise should be excluded from the room, and the diet should be restricted to tepid slops. Should the patient be younger, as, for instance, below the third year of his age, the loss of blood will not be borne so well; still, however, general bleeding to the extent of two or three ounces, or till an effect is produced upon the pulse and countenance, while the child is kept raised in bed or sitting on the lap, or its local abstraction by leeches, or still better by cupping, may be had recourse to: but should the child still be at the breast, very great caution must be used in the direct abstraction of blood; two or three leeches even often sinking an infant at this period of life to a most alarming degree, and producing symptoms which themselves simulate the very affection of the head which we are wishing to overcome or to prevent.

In proportion as we are less able to act by direct depletion, we must trust the more to other means of allaying the inflammation, while we very cautiously seek out every probable source of irritation influencing the susceptible

brain of the infant. The very free action of the bowels, the moderate application of cold to the head, the gentle determination to the skin and kidneys, and the cautious though decided introduction of mercury into the system, will be the remedial measures to be adopted. With regard to the quantity of mercury to be used, and the form, this must depend in a great degree upon the age of the patient, his strength, and the urgency of the symptoms. In very young children, the hydrarg. \bar{c} cretâ, in doses from one grain to three, every three or four hours, and the external use of mercurial ointment, in quantities not exceeding a scruple, three times a day. In older children of two, three, or four years of age, the dose may be nearly doubled, or calomel may be substituted: and in adults, the combination of calomel with blue pill, to which half a grain of squill powder can be added, may be administered every three hours, and a drachm of the ointment carefully rubbed in three times a day. Amongst the sources of irritation to which our attention is to be turned, the progress of the teeth, and the condition of the alimentary canal, claim our unceasing care. Should the gums be swollen, and the teeth obviously approaching to the surface, it will be right to cut down freely upon the teeth, whether any signs of uneasiness have been observed or not; nor should we be afraid of performing this little operation though the teeth be not far advanced; and even in older children, or in young people, in whom the posterior molar teeth may by possibility be coming forward, we should never neglect this treatment. With regard to the bowels, it will be necessary to examine the motions carefully, and as far as possible to regulate the quality as well as the quantity of the evacuations. Mercury in all, but more particularly in children, is apt to derange the bowels and irritate the mucous membrane; and in young children there is no doubt,

from the appearances after death, that this is often quite sufficient to have afforded a new and very important source of general disturbance. If, therefore, in children, when the stools become green and slimy, as will most frequently occur during the exhibition of calomel, the legs are drawn up and indications of abdominal pain are perceived, the mercury must be combined with chalk, or with the compound chalk powder with opium, or a very minute quantity of some opiate may be given in combination with the quantity of calomel which is thought necessary; and at the same time, if the symptoms should increase in spite of the measures adopted, the mercurial ointment, in quantity from a scruple to a drachm, according to the age of the patient, may be rubbed in over the abdomen, arms, and thighs three times a day, instead of part of the mercurial which has been hitherto administered by the mouth.

The combination of antimony with the mercury, which the inflammatory nature of the disease would appear to indicate, is not always allowable, owing to the great tendency to sickness with which this disease is marked; and moreover, because the antimony is apt to increase the irritation of the lining membrane of the bowels, and in that way to do mischief: when, however, it can be borne, more particularly in adults, the addition of a quarter or a sixth of a grain of the tartarized antimony to each dose of the calomel will produce a beneficial effect on the skin, and tend to reduce the inflammation.

Should the pain in the head continue or increase, as plainly expressed by the adult, or rendered probable by the cries and the languid hanging of the head in the child, we shall have reason to fear that the more confirmed stage of inflammatory action is taking place, and it will be necessary to repeat the bleeding, and again repeat it after the lapse of a few hours; for it must be always borne in mind

that it is in the first and second periods only that this remedy is applicable, that if judiciously and boldly employed it may put a stop to the disease, and that if we do not make an impression in this stage of the disease, all remedies which can afterwards be employed will be of much more doubtful efficacy. In the fully-developed child, then, and much more in the adult, bleeding to the extent already mentioned, and with the restrictions which a consideration of the effects produced must always impose, may be repeated three or four times in pretty quick succession, if the pulse is irregular or oppressed, and more especially if rendered more free and round by the loss of blood. After this, blisters should be applied to the neck and be kept open or repeated, and sometimes, when applied to more distant parts, as to the pit of the stomach or even to the legs, they act beneficially on the principle of counter-irritation. These may afterwards be dressed with the mercurial ointment; for it is a matter of very great importance to produce the action of the remedy if it can be done without irritating the bowels, and it speedily affects the system when thus applied.

Various diuretics, but particularly the digitalis, in the form of infusion for adults, in doses from one to two drachms, and for children the powder, in doses of half a grain every four hours, and if the stomach will bear it, the squill in small divided doses, may be brought to act a most important part in combination with mercury; and when there is much screaming, and the restlessness gives evidence of nervous irritation, the tincture of opium, from one to four minims, according to the age of the patient, at first cautiously administered, and increased till its effects are ascertained, will often greatly favour the recovery: or the extract or powder of conium, in grain doses, may be combined with the calomel or with the calomel and digitalis.

Unfortunately, however, in spite of all our best-concerted measures, the disease too often proceeds, though perhaps with moderated course, and the third period gradually creeps on, or more suddenly develops itself. The pulse becomes very quick, and a state of coma alternates with shrieks which rend the air, or with convulsions; blindness and paralysis appear to proclaim that a fatal change has taken place in the brain. Still, however, we are not to relinquish our remedies; we are to proceed with the mercurials, and we are carefully to watch the changing symptoms as they occur; still we are to use occasionally blisters; still, if the patient is capable of taking medicine, we are to administer diuretics and mild purgatives, and not unfrequently, even in this advanced stage, opiates when the temporary irritation is great. And in this way we shall occasionally be gratified by finding even the worst symptoms gradually subside, and a slow convalescence crown our exertions with success.

Having thus spoken of Hydrocephalus as a purely inflammatory disease, it is right that the student should bear in mind that effusion takes place into the ventricles and in the membranes of the brain in children and young people, under other states of constitution, where from its very insidious and often its chronic form, the evidence of inflammatory action is altogether wanting: this occurs in states of inanition, whether attendant on original feebleness of constitution, or as the effect of diseases; and in anasarca subjects; and in its still more chronic form is found as a disease incident even to the foetus while still in the uterus.

Precautionary measures with a view of preventing the Disease.—It is the duty of the practitioner always to bear in mind that, in a disease so frequently fatal as Hydro-

cephalus proves, when it has once shown its unequivocal symptoms, every precaution should be taken which affords the slightest probability of preventing its occurrence; and the more he has reason to believe that an hereditary tendency exists in a family, or the more from any constitutional peculiarity he sees cause to fear its arising, the more strictly should he enforce every precautionary measure.

In the first place, a careful attention to diet should be inculcated; a simple, mild, nutritious diet, equally remote from that which may debilitate and that which might overstimulate, and this must be modified according to the tendency of the child. In most children animal food is required once a day at least, but we occasionally find children requiring more; and sometimes we meet with children, and even with whole families of children, in whom there is so great a tendency to become full and corpulent, that no animal food, and scarcely milk, can with safety be allowed above every second day or perhaps twice in the week.—Secondly, a daily and scrupulous attention should be paid to the state of the bowels. The nurse should be instructed to habituate the child to have its motions at some particular hour night and morning, and should be told to observe not only the quantity but the quality of the evacuation: if it be watery or slimy, or deficient in bile, we shall either find that the diet is faulty or some medicine is required, and then the simplest and mildest should generally be employed; a few grains of magnesia and rhubarb, or a little infusion of senna; occasionally, but only rarely, a slight mercurial may be needed; half a grain or a grain of calomel may be added to the magnesia, or from one to three grains of the hydrargyrum c̄ cretâ may be given overnight, and followed by a tea-spoonful or more of castor oil in the morning; or a grain of this mild mercurial may be repeated for two or three nights, and the castor oil be given

on the second or third morning.—Thirdly, the clothing of delicate children claims our particular attention, not to accustom such children to over-warm clothing, but on the contrary to call gradually into full exercise that power of generating heat which is an important function of the young animal frame; but, at the same time, this is to be done without exposing the child to the sudden alternations from heat to cold, and a thin covering of flannel should always be worn on the more susceptible parts.—Fourthly, children should avoid such exercises as are likely to derange the natural course and impulse of the circulation; all sudden jerks or violent commotions should be avoided, and if by any accident a child has experienced a blow on the head, it should never be neglected. If the injury be but slight, a gentle laxative may with propriety be administered, and a low diet maintained for a few days. If the injury be more severe, we should be satisfied that the bowels are again and again emptied of their contents; and if still greater reason for anxiety should present itself, the local abstraction of blood must be adopted.—Fifthly, it is above all things important to attend to every symptom of irritation as dependent upon the process of teething. There is no operation to which the system of the child is naturally subjected more trying than this, or more likely to induce irregular circulation in the brain; and it is absolutely necessary, while it is going on, to look not only to the general state of health, but to the local irritation, for the relief of which nothing is so effectual, nothing so safe, as the free and frequent lancing of the gums.

CHRONIC HYDROCEPHALUS.

This term is used to designate a disease the essential nature of which is an accumulation of serous fluid within the ventricles, or more rarely between the membranes of the

brain; but how far this depends on an action analogous to inflammation in the commencement is not known. From some cause, then, of which we are ignorant, it not unfrequently occurs that at the time the fœtus is arrived at the period when it should be expelled from the uterus, and even long before that period, a morbid and often a most excessive accumulation of watery fluid takes place within the ventricles of the brain. This sometimes goes to such an extent, as to prevent the possibility of the birth of the child, and it becomes necessary to draw off the fluid before the head can pass from the pelvis. At other times, the child is born with the head not at all, or very slightly, disproportioned to the body; but in a few days or weeks, or perhaps not till a few months have passed, it is perceived to increase beyond the usual ratio; it becomes deformed; the two frontal bones, instead of falling gently backward, generally assume a perpendicular or even a projecting position; the two parietal bones open and fall towards the neck: thus the head becomes distorted, and the sutures so separated, that a space of two or three inches often intervenes between the bones. Sometimes at birth, and sometimes a few weeks after, the sight is lost, though the hearing generally remains acute, and as the months pass on, instead of the intellect gradually unfolding itself, the mind is almost stationary, and often the powers of the body are paralysed. In other cases, tolerable health is maintained and the intellects are in their ordinary state of development, and very little paralysis is experienced, although the enormous weight of the head is such as to render it impossible for the child to walk or balance itself. The process of ossification in the skull goes on irregularly, so that we often find small patches of membrane left unchanged in different parts, and it proceeds with various degrees of rapidity; sometimes, al-

though the extent of bone to be formed is so much greater than natural, the sutures are closed by the fourth or fifth year; at other times the process is not complete till much later, and is often assisted by the formation of bone from additional centres of ossification, so that small bones are to be felt lying separate in the wide spaces of the sutures, which after a time meet together, forming numerous ossa triquetra. At length the process is completed, and if the tendency to accumulation of fluid is not previously checked, we usually find the symptoms, both bodily and mental, increasing rapidly about this period. The child becomes the subject of frequent convulsions, is paralysed, and loses part or the whole of that limited share of intelligence which it possessed; but it is possible that a short respite may be given to such a result by the opening of the closed sutures. When the tendency to accumulation has ceased before the closing of the sutures, we occasionally find persons who have been in a moderate degree affected with the malady living in a comfortable state for many years; and though in general persons of weak or imperfect intellect, are still able to perform many of the duties of life, enjoying a fair share of health, and dying at length of other diseases.

The *morbid appearances* presented in this disease are, in recent cases, deficiency of the bony structure of the cranium to a greater or less extent, and effusion of serum, sometimes between the membranes, but much more generally into the ventricles, which become distended in a most enormous degree, communicating freely with each other by the foramen of Monro, which is often large enough to admit the little finger; while the parietes of the ventricles are rendered remarkably firm, often assisted by the thickening of the lining membrane. When the disease has advanced very far, the ventricles are occasionally so much dilated that the whole hemispheres appear to be unfolded, forming little more than

a thin lining to the cranial vault; at other times, having forced its way through the cerebral matter, the serum has risen between the hemispheres, and gradually compressed them, so that the whole brain has been found occupying the basis of the skull; and sometimes the pressure and absorption have been so great that only a very small portion of the brain and cerebellum has been discovered. Sometimes, where inflammatory action has preceded death, a considerable portion of the brain has been found in a flocculent state, partially mingled with the fluid. In cases where the disease has undergone a permanent cure of many years' duration, the skull is often of unusual thickness, and the dura mater is sometimes partially ossified.

Of the *causes* of this disease nothing is known: it is probably connected with the strumous constitution, and a weak, inflammatory process.

The *diagnosis* is too obvious to need any observations.

The *prognosis* is very unfavourable, the disease terminating almost always in early death, after a few years of imbecility. When the contrary is the case, the head remains permanently enlarged, containing a large quantity of fluid, and the intellects are seldom fully developed.

The *treatment* consists chiefly in an attempt to support the general health and remove all sources of irritation from the system. Healthful air and healthful nourishment are amongst the most important means; but it is right at the same time early to adopt some very mild alterative course of mercurial treatment, small doses of the hydrarg. c. cretâ, or fractional portions of a grain of calomel with soda and chalk; and when the child has arrived at a firmer age, blisters may be applied to the neck or behind the ears, and dressed with the mercurial ointment. The fluid has occasionally been drawn off from the ventricles by an operation of paracentesis; and the apparent success which is

said to have attended some of the cases holds out a slight encouragement to a more extensive trial of this precarious remedy. There is no doubt that many cases will fail, for in some the tendency to pour out fluid continues unabated, and between each successive operation the head rapidly increases; but if fortunately, as sometimes happens, in the operations of paracentesis of the abdomen the tendency to accumulation should have ceased, either from the effects of remedies or from some local change depending upon the abstraction of the fluid, and if the cerebral disorganization should not be totally irreparable, a cure may be effected. Still, however, it remains to be proved to what extent such cures will be satisfactory as regards the future mental condition of the child, and probably a small proportion only will even apparently succeed.

There are two other forms of disease which seem to bear a certain relation to Chronic Hydrocephalus, the *Spina bifida* and *Congenital hernia cerebri*. *Spina bifida* is a deficiency in the bony structure of the spinous processes of the vertebræ, and is generally attended by an unnatural accumulation of fluid, which forms a bag at the defective part of the spine wherever it may be.

The most successful treatment of this disease has consisted in drawing off the fluid frequently by puncturing with a fine needle, and then carefully applying a bandage—a mode of treatment, however, which is less applicable when the spina bifida is connected with chronic hydrocephalus, or when the deficiency of the spinous processes is very extensive, or when considerable paralysis of the lower extremities exists.

Congenital Hernia Cerebri is an affection very closely allied to the last, and consists in a deficiency in some part of

the bony parietes of the skull, attended with the protrusion of a portion of the brain and its membranes. The tumor thus formed is generally found to contain within its cavity a fluid, and communicates immediately with the lateral ventricles. The fluid has occasionally been drawn off in this case likewise; but perhaps the most prudent course is to maintain the general health, and not to interfere with the local disease.

Serous cysts formed in connexion with the arachnoid, and apparently lying between its layers, or attached by thin adventitious membranes, have occasionally been discovered on dissection, but they have generally produced no peculiar symptoms.

CYNANCHE TONSILLARIS, ANGINA TONSILLARIS, TONSILLITIS, QUINSY, OR COMMON INFLAMMATORY SORE THROAT.

This disease consists in inflammation affecting one or both tonsils, and occasionally extending to the arches of the palate, to the uvula, and to the velum pendulum palati. On inspection, the affected tonsil is observed to be red and swollen, and not unfrequently presents at the same time a dry, smooth, and shining appearance. It however very commonly happens that, sooner or later, the inflamed surface becomes studded, or more or less extensively covered with masses of morbid secretion, either from the mucous follicles or from the inflamed mucous membrane itself. These morbid secretions most frequently present the appearance of small, whitish or greyish aphthæ, distinctly circumscribed, and of a roundish or oval form. In other cases they are more extensive, more irregular in their form, and of a greyish or greenish colour, when they are liable to be mistaken for suppuration or sloughing of the parts beneath.

Should the pillars of the fauces, the velum and uvula be involved in the inflammation, we find all these parts red and swollen, the velum probably overspread, to a greater or less extent, with a mass of adherent greyish or greenish secretion, or the uvula elongated, œdematous, and sometimes partially or universally discoloured by a similar morbid product.

The patient first complains of roughness, rawness, or other uneasiness in his throat, which is speedily followed by actual pain, varying in degree with the intensity and extent of the inflammation, but being pretty uniformly most severe when the individual is of a rigid fibre, and of a plethoric habit of body. The pain is greatly aggravated by every attempt to swallow either food, drink, or even the saliva; and indeed in some cases, especially when both tonsils are affected, the pain is so exquisite, that deglutition is either altogether impracticable, and the saliva dribbles from the mouth; or the patient, unable to resist the inclination to swallow, is almost thrown into convulsions at each effort; or, on attempting to swallow liquids, they pass into the posterior nares, and are forcibly rejected from the nostrils. The pain is sometimes limited to the throat, at other times it is severely felt also in the course of the Eustachian tube, and extends to the ear of the side affected. The voice is thick, nasal, or guttural, and the articulation imperfect, producing a change in the patient's speech, which is so highly characteristic of the disorder, as at once to declare its presence to a person of the most ordinary experience. The swelling, although generally confined to the internal throat, can now and then be distinctly felt or even seen externally below the angle of the jaw; but even where this is not the case, the internal pain and tumefaction are sometimes so considerable, that the patient can neither protrude his tongue nor open his mouth to a sufficient extent to admit of a pro-

per examination. Should the uvula be involved in the inflammation, it becomes relaxed, elongated and œdematous; and falling back upon the epiglottis, produces a constant tickling, and repeated and painful hawking and coughing, or such a degree of irritation, as to excite a feeling of nausea, or even actual vomiting.

These local symptoms are occasionally, but not always, preceded by chilliness, lassitude, loss of appetite, and other premonitory signs of a febrile state, and are presently attended by thirst, heat of skin, a remarkably white and loaded tongue, high-coloured urine, a frequent full pulse, and in some cases by such a degree of cerebral disturbance as to amount to actual delirium.

Terminations.—The disease most commonly terminates in *resolution*, the pain and swelling gradually subsiding in a few days, especially if proper treatment have been employed. It more rarely happens that the pain ceases somewhat abruptly, the comparatively sudden cessation being succeeded by a mere sense of crackling in the throat on each effort made by the patient to swallow. When the inflammation is very acute, it is very apt to proceed to *suppuration* either in the tonsil or tonsils, the velum or uvula, according to the seat of the disease. Certain individuals appear to be peculiarly prone to this mode of termination; but, generally speaking, it is most likely to happen in young, plethoric, and irritable subjects, and particularly so if the disease have been neglected at its commencement. The suppuration is occasionally preceded or accompanied by distinct rigors; but such rigors are by no means very commonly observed; and although the early neglect, the long persistence of the inflammation, or the character of the pain changing from acute to dull and throbbing, together with a continuance or even increase of the mechanical obstruction to respiration and deglutition, may now and then create a strong sus-

picion of its having taken place, it is only by an examination of the parts, and the detection of fluctuation, that we are enabled to arrive at positive certainty. When an abscess is thus formed in the tonsil, probably after burrowing some way beneath the soft palate, it most commonly happens that, sooner or later, the patient, in the act of coughing or hawking, causes it to burst, and its contents, which are for the most part extremely offensive both to the taste and smell, escape, and are either rejected from the mouth or pass down into the stomach, the difficulty of respiration and deglutition being thereby immediately and almost entirely removed.

Cynanche tonsillaris does not often lead to *ulceration*, or if it do, the ulceration is almost uniformly extremely superficial, unless it happen to succeed to suppuration; its termination in *gangrene* is scarcely ever met with; it may pass into a more chronic form of the disorder, or what is much more common, it engenders a strong predisposition to a return of the complaint from comparatively slight causes.

Causes.—The disease prevails most in spring and winter, but is by no means uncommon at other seasons of the year, except during the warmest months of summer. A peculiar idiosyncrasy appears to exist in certain individuals, who on that account, and without any obvious reason, are peculiarly susceptible of the disorder. It is most commonly met with in irritable and plethoric subjects, between the ages of eighteen and forty, but especially in those who, from the nature of their occupation, are much exposed to damp and cold. The long-continued use or the abuse of mercury appears in every instance to create or increase the predisposition; but perhaps the most powerful of all the predisposing causes is a previous attack, which never fails to leave behind it a remarkable tendency to a return of the complaint.

The ordinary *exciting cause* is cold, applied either to the body generally, to the feet, or to the neck, and especially when accompanied by moisture or by a current of air, or when the body has been previously overheated and fatigued. It may be occasioned by the patient discontinuing some accustomed covering of the neck; or it may be excited by mechanical or chemical violence, such as, awkward use of a tooth-brush, a piece of bone, a pin, or an acrid or corrosive poison.

Diagnosis.—Although the disease is for the most part readily distinguished by the history of the case, by the pain and difficulty in swallowing, by the thickness and guttural or nasal character of the voice, by the peculiar and imperfect articulation, and by the appearance of the throat on making an ordinary inspection; nevertheless, when practicable, a minute and careful examination of the parts affected should never on any account be neglected, not only with a view to confirm the diagnosis, but to ascertain at the same time whether any mechanical cause is producing the disease, or whether it may not arise from merely an accidental aggravation of a mercurial or syphilitic ulcer previously existing in the throat. Inflammation of the lower part of the pharynx and upper portion of the œsophagus, being attended with pain in swallowing and imperfect articulation, may, without a proper examination, be hastily regarded as an ordinary attack of Cynanche tonsillaris. It must also be remembered that Scarlatina anginosa at its commencement very closely resembles this disease, and that both measles and small-pox are occasionally accompanied by considerable inflammation about the internal throat, as will be more particularly pointed out when we treat of these respective disorders.

Error in the general diagnosis is comparatively rare, whereas it is by no means uncommon to form a false esti-

mate of both the degree and kind of the local mischief in very ordinary cases. When the tonsils are naturally large, they may be supposed to indicate a much higher degree of inflammation than really exists; and when morbid secretion of a whitish, grey, or green colour becomes closely adherent to the tonsils, the uvula, or velum, the appearances thereby produced are very apt to be mistaken for ulceration, suppuration, or sloughing, although on forcibly removing the morbid matter from these parts, the mucous membrane will pretty uniformly be found altogether free from the least abrasion.

Prognosis.—Cynanche tonsillaris is, generally speaking, altogether free from danger, but cases do now and then occur which greatly endanger life, or even prove fatal. In such cases, the danger chiefly arises either from long-continued irritation, with inability to take nourishment, leading to the exhaustion of the powers of life; or, from merely mechanical obstruction and consequent asphyxia. In other rare instances the inflammation extends to the larynx, and subjects the patient to all the perils of laryngitis. In ordinary cases, the history of a previous attack will sometimes afford us assistance in judging of the probable result; but as a general rule, the degree of danger is to be estimated by the violence and extent of the inflammation, the acute form of the disease being most formidable when it involves both tonsils at the same time. The intensity of the inflammation, as well as the degree of tumefaction, may be inferred from the extreme pain and difficulty of deglutition, and from the escape of fluid through the nostrils on attempting it, from the dribbling of saliva from the mouth, from the total inability to articulate, from the pain and difficulty of opening the mouth or protruding the tongue, and from the mechanical obstruction to the breathing. When the disease occurs in good constitutions,

when the disease is early and properly treated, and when under such treatment the local pain and difficulty of articulation and deglutition are manifestly relieved, we may entertain good hopes of a speedy recovery, especially if, at the same time, the skin becomes uniformly bedewed with a gentle moisture, the tongue gets cleaner, and the urine deposits a lateritious sediment. When, on the contrary, the disease has been neglected, when the deglutition is impracticable, and when the breathing is greatly obstructed, it ought always to create some alarm for the safety of the patient; and should the patient be old, or should he, though young, have been brought into a cachectic state by intemperance, or by the abuse of mercury, there will at all times be grounds for apprehending that the inflammation may extend to the larynx, and give rise to that inflammatory infiltration which constitutes the extremely dangerous affection called œdema glottidis. It is when Cynanche tonsillaris has been neglected or improperly treated, that it is most liable to terminate in some of the more chronic forms of the disorder.

Treatment.—The activity of the treatment must be determined by the severity of the inflammation, the degree of febrile excitement present, by the age and constitution of the patient, and, if not a first attack, by a knowledge of what afforded relief on former occasions. When the fever is considerable, or even when it is slight, provided the local inflammation be severe and the patient of good constitution, a general bleeding, to the amount of from twelve to twenty ounces, will be found a very good practice at the commencement, followed by a brisk purgative. The purge may consist of from four to six grains of calomel, given in a little butter if there be very great difficulty in swallowing, followed in four or five hours by a dose of scenna and salts. In other cases, either the calomel or the hydrargy-

rum \bar{c} cretâ may be given with three or four grains of antimonial powder, instead of the calomel alone, especially when the difficulty in swallowing is less. In perhaps the majority of cases, general depletion will not be required, but in every instance almost certain and considerable relief will be obtained by the application of from six to twelve leeches behind the angle of the jaw and to the external throat, followed by hot fomentations, or by a large warm poultice. Scarification of the inflamed tonsils has been recommended, but is not perhaps upon the whole so desirable a practice. Should any doubt exist respecting the propriety of further local depletion, should former experience have shown its utility, or should the case prove originally of only moderate severity, a blister to the throat will often prove a valuable remedy. A very important object in every case is to promote perspiration, by confinement to bed, by the use of warm diluent drinks, such as barley water or tea, and by the administration of diaphoretics; of the latter, antimonial wine to the extent of twenty or thirty minims, may be given in the liquor ammon. acet. mixture every four or six hours; to each dose of which, half a drachm or a drachm of sulphate of magnesia may occasionally be added with good effect. In other instances, the patient will feel more refreshed, and at the same time diaphoresis will be promoted by the use of refrigerants, such as the common effervescing draught frequently repeated; or the compound infusion of roses, as common drink, with or without a few grains of nitre, and an additional quantity of sugar to make it more palatable. Should the urgency of the case require it, the leeching and poulticing may be repeated once or oftener; but in every instance it is of the first importance to act freely on the bowels, either by means of the mixture already mentioned or by the senna and salts, or if they irritate the throat, by means of castor oil. Of course, during the whole progress

of the treatment, the antiphlogistic regimen must be observed, the patient should abstain from talking, and have his apartment maintained at a proper temperature.

In order to remove the morbid and excessive secretion poured out by the inflamed mucous membrane, gargles have at all times been strongly recommended, and no doubt it is a matter of no small importance to relieve the irritation about the throat, and thereby enable the patient to desist from the hawking and painful attempts to swallow to which such morbid secretions give rise; but in doing this we must be careful not to employ such stimulating compositions as are liable to aggravate the inflammation. During the highly inflammatory period of the disorder, therefore, the gargles should consist of the very mildest materials: barley water alone, or slightly acidulated with lemon juice; or the same bland fluid with one-eighth part of the mel rosæ, or the same proportion of mel boracis, will probably answer the purpose very well. At a more advanced period, or when the inflammation is more moderate, the compound infusion of roses, either alone or with one-eighth part of mel rosæ, may be substituted. It is seldom that more active gargles can be employed with propriety in ordinary attacks of acute Cynanche tonsillaris. The inhalation of the vapour of hot water, or merely holding the open mouth over a vessel containing hot water, occasionally affords considerable relief, and may at all times be had recourse to with perfect safety.

When the disease passes on to suppuration, it commonly happens that sooner or later the abscess either bursts spontaneously, or on the patient making some unusual effort in hawking or coughing; but should the general symptoms, and especially an obvious fluctuation, indicate the presence of an abscess, it ought unquestionably to be opened. In performing the operation, some caution is necessary, lest

by plunging an instrument too deeply into the parts, we should wound some important blood-vessel. It ought to be performed in such a manner, therefore, and with such an instrument, as to render such an accident impossible. During convalescence, some stimulating and anodyne liniment may be freely applied externally, night and morning, the patient being directed to wear a piece of flannel round the neck in the intervals of the application. The liniment. ammoniæ, or the lin. sapon. co. with tinct. opii, in the proportion of two drachms of the latter to an ounce of either of the former, may be used for the purpose.

CHRONIC SORE THROAT.

Although a chronic inflammatory affection of the internal throat may be a mere result or sequel of a more acute attack, it not unfrequently assumes more or less of a chronic character from the beginning. It is especially distinguished by the absence of general febrile excitement, and by the pain and difficulty in swallowing being extremely moderate or nearly altogether wanting; it is usually known by the name of *relaxed throat*, and is moreover remarkable for its obstinate resistance to remedies in many instances, and for its great liability to be reproduced by very slight causes. It is chiefly met with in persons of a lax or scrofulous habit, in those who have previously undergone frequent attacks of the more acute forms of inflammation in the throat, who reside in a low, damp, or otherwise unwholesome situation, or who suffer much from derangement of the digestive organs; whilst a predisposition to it is pretty uniformly engendered or increased when the system has been powerfully or frequently acted upon by the internal administration of mercury. Like acute inflammation of the same parts, it prevails most in cold and temperate climates, and especially during spring and win-

ter; and like acute inflammation, it is most frequently excited by general or partial exposure to cold, especially when combined with moisture. It is often produced by the habit of snuff-taking; sometimes, though more rarely, by smoking, and occasionally by the presence of a decayed tooth. It occurs as a symptom in a great variety of chronic diseases, especially towards their fatal termination; it is frequently observed in the progress of visceral disease in general; in diseases of the mucous membrane of the intestinal canal; and almost uniformly towards the close of phthisis pulmonalis; and of hectic fever, from whatever cause. The appearances in the throat, as well as the degree of actual inflammation, differ in different cases; in some we observe merely a general blush of redness, more or less deep, extending probably over both tonsils, the velum and uvula, and occasionally into the posterior part of the pharynx; in others, the inflammatory blush is more limited, we have the velum and uvula apparently alone affected, the latter organ under such circumstances being not unfrequently relaxed, slightly œdematous, and elongated, producing a troublesome dry cough, frequent hawking, and occasionally a feeling of nausea. In most cases, the mucous membrane, although red, is nevertheless moist, and without anything remarkable in the character of its secretion; in some instances, however, it presents a diffuse shining redness, with a degree of dryness, which gives to the whole an appearance very closely resembling erysipelas; at other times, we find a few greyish or whitish aphthæ scattered over the tonsils, velum, or posterior pharynx.

In these chronic forms of inflammation of the throat, there may probably be slight pain and difficulty in swallowing, and a trifling degree of hoarseness; but in general the inconvenience felt amounts to little more than a sensation of dryness, roughness, or other uneasiness, which gives rise

to hawking, or probably to cough, unattended by any considerable expectoration. In some cases, however, but especially when the affection of the throat is symptomatic of severe or fatal visceral disease, the voice becomes gradually so hoarse that the patient cannot speak above a whisper, a condition which appears to arise partly from a deficiency of secretion, but chiefly from the disorder extending to the mucous membrane of the larynx.

In regard to *Diagnosis*, it is only necessary to offer a caution against overlooking an ulcer of a mercurial or syphilitic origin, which may be producing the apparently chronic inflammation of the throat, and which is often so situated in the tonsil, velum, or posterior pharynx, as to escape detection without a careful inspection of the parts. On the other hand, a mere mass of morbid secretion adhering to some part of the mucous membrane, or filling up one of the natural furrows of the tonsils, must not be mistaken for an ulcer. An ulcer, and especially a deep ulcer, is of extremely rare occurrence in either the acute or chronic forms of common inflammation of the throat; the very existence of such an ulcer, therefore, almost amounts to a certainty of its mercurial or syphilitic origin.

Treatment.—Previous to employing either general or local remedies, the nature of the predisposing and exciting causes must be carefully investigated, inasmuch as their mitigation or removal will in every instance constitute a most important, and, indeed, essential part of the plan of treatment. The residence, therefore, of the patient should be changed, if desirable and practicable; his injurious habits corrected, whether those of intemperance, or the more venial practices of snuff-taking or smoking; whilst proper means must be directed to the improvement of the health generally, and of the state of the digestive organs in particular. The latter objects are to be accomplished by gentle laxatives, the mild-

est mercurial alteratives, tonics, and a proper diet and regimen. With a due regard to these points, the activity of the purely local remedies must be determined by the degree of inflammation present, and by the constitutional vigour of the patient. They will consist of leeches, blisters, and stimulating and anodyne embrocations, together with emollient, stimulating, or astringent gargles, accordingly as one or the other shall be found to answer best in any individual case. Leeches and blisters may be directed for cases in which the inflammation assumes a more decided character, and for those occurring in moderately good constitutions; whereas embrocations composed of *lin. ammoniæ*, or of *lin. sapon. comp.* and *laudanum* may be applied to the external throat, when the disease assumes a milder or more atonic form. A similar principle applies generally to the employment of gargles, which ought to be mild in proportion to the activity of the inflammation. Seven parts of *infus. rosæ eo.* with one of *mel rosæ*; the same proportions of barley-water and *mel boracis*; the *infus. serpentariæ*, or the *infus. rosæ co.* with *alum*; may be mentioned amongst the milder forms: the decoction of bark with sulphuric acid, the infusion of roses with tincture of myrrh, or with tincture of capsicum, and the solution of chlorinated soda, may be enumerated amongst the most active; the strength of each of them being regulated by the rule already laid down. The application of a solution of nitrate of silver, in the proportion of ten grains to an ounce of distilled water, by means of a camel-hair pencil, has had an excellent effect in some instances; in others, finely-powdered hydrochlorate of ammonia, applied by means of the moistened finger, has speedily afforded relief. Many persons affected with this disorder have experienced considerable benefit from the use of various forms of demulcent, anodyne, stimulating, or astringent lozenge, such as common extract of liquorice, the

trochisci glycyrrhizæ ē opio of the Edinburgh pharmacopœia, the cayenne, or catechu lozenges.

The patient should guard against exposure to damp and cold, and especially night air: he ought to be well clothed, and wear a piece of flannel round the neck during the whole of winter and spring.

CYNANCHE PHARYNGEA, OR PHARYNGITIS.

Although it is by no means uncommon for both the acute and the chronic, the idiopathic and the symptomatic forms of inflammation of the throat, to involve, to a greater or less extent, the posterior part of the pharynx, it is nevertheless certain, that acute idiopathic pharyngitis, or that in which the inflammation is limited to the pharynx, is of extremely rare occurrence. We have only seen two instances of the kind. One occurred in a female beyond the middle period of life, the other in a man between 40 and 50 years of age. The female, after exposure to cold, was attacked with pain in the throat, and great pain and difficulty in swallowing, speedily followed by the ordinary signs of febrile excitement. The pain and difficulty in swallowing rapidly increased, till at length the smallest particle of food or drink could not be taken. The voice was distinct, but the articulation imperfect, as if the patient were unable or unwilling to exert the laryngeal muscles. On making a careful inspection, scarcely the slightest trace of inflammation could be detected in the throat, nor could the epiglottis be distinguished; but on making pressure on one spot externally on the right side, and at the posterior part of the thyroid cartilage, the patient complained of acute pain. She was bled from the arm, and had leeches applied to the neck, followed by a large warm poultice, and the inhalation of warm water va-

pour. Under such treatment the disease yielded in a few days to such an extent that she was again able to swallow; but acute pleurisy now supervened, which, in her reduced state and bad constitution, speedily proved fatal. On examining the parts after death, unequivocal marks of acute inflammation were found at the lower part of the pharynx, the inferior portion of the epiglottis, and posterior surface of the arytenoid cartilages, together with such a degree of purulent infiltration into the submucous cellular tissue in the latter situation, as almost to present the appearance of an abscess, although the cellular structure itself was not broken down. Had not the disease been subdued, this might undoubtedly have passed into a state of abscess, which, by its increase of size, and consequent pressure upon the larynx, would probably have seriously interfered with the process of respiration, or even have proved fatal by producing suffocation. The symptoms of the other case bore an exact resemblance to the above, with the exception of the pain on making pressure externally, which was not present in that instance.

Besides the remedies mentioned in the case just given, provided the patient can swallow, two or three grains of calomel, with one of opium, and a quarter of a grain of tartar emetic, may be given every three or four hours, so as quickly to affect the system; or if deglutition be impracticable, we would recommend inunctions with the strong mercurial ointment for the purpose, a drachm being carefully rubbed into the thighs and legs two or three times a day—placing, at the same time, a portion of the ointment in each axilla. If a purgative cannot be given occasionally by the mouth, glysters should be had recourse to.

**CYNANCHE MEMBRANACEA. SORE THROAT,
WITH FALSE MEMBRANE, OR DIPHTHÉRITE.**

The above terms are intended to designate certain acute or sub-acute forms of idiopathic or symptomatic inflammation of the throat, which in their progress, for the most part display somewhat of an atonic character, and which, moreover, speedily give rise to a morbid, albuminous and membranous-looking secretion, partially or generally covering that portion of the mucous membrane which happens to be involved in the disease. In the majority of such cases the inflammation is considerably diffused, so as to affect the whole of the internal throat, including the tonsils, the arches of the palate, the velum, uvula, and posterior parts of the pharynx: it not unfrequently extends to the larynx, trachea, and bronchial tubes, giving rise to symptoms of croup, and occasionally passes into the posterior nares, the Eustachian tubes, or frontal sinuses.

This modification of inflammation is seen in its most exquisite, severe and dangerous form in Scarlatina or Cynanche maligna, and will be more fully described when treating of that disorder. As an idiopathic or original disease, it is of comparatively rare occurrence in this country, either in its acute or sub-acute form; and of the cases met with, some have presented symptoms of acute fever and active local inflammation; both the general and local symptoms nevertheless partaking of an asthenic character: in others, neither the general febrile disturbance nor the local inflammation has appeared by any means to be considerable. When present, the constitutional symptoms are usually chilliness, shivering, languor, lassitude, debility, and loss of appetite, succeeded by headache, a hot and dry skin, thirst, a foul injected tongue, and a frequent but compressible pulse. There is very commonly some degree of pain or stiffness

about the neck, and perhaps slight tumefaction of the glands in the neighbourhood: the patient complains of a sense of roughness or obstruction in the throat, with pain and difficulty in swallowing; the pain, however, although occasionally severe, is often extremely moderate; the breathing is somewhat thick, the voice nasal or guttural; and when the disease extends to the larynx, alarming symptoms of croup are superadded to the original complaint: the breathing is greatly obstructed; the patient is obliged to make increased and increasing efforts, especially during inspiration; the face becomes livid or pale, the pulse rapid and feeble; the strength fails, delirium or coma supervenes; cold, clammy sweats break forth, and the patient dies from the combined influence of exhaustion and oppression, or he is cut off unexpectedly, in consequence of a sudden increase of obstruction to the process of respiration.

On inspecting the throat of a person affected with this disease, we perceive manifest indications of a greater or less degree of inflammation; the redness, however, although occasionally vivid, is more commonly of a deeper crimson or slightly livid hue; and generally involves, at the same time, the tonsils, velum, and the whole of the pharynx.

At an early period of the disorder, small specks or patches resembling aphthæ, of an opaque, whitish or greyish colour, are observed irregularly scattered over the inflamed mucous surface: these coalesce, and at length form a continuous albuminous-looking membrane, varying in colour, consistency, thickness, and extent in different cases. It is this membranous coating which constitutes the peculiar and most important feature of the disease; and as it is liable to extend to the larynx, trachea, and even to the larger bronchi, it occasionally proves a most serious impediment to respiration, giving rise to the symptoms observed in fatal cases of croup.

As the forms of inflammation of the throat which lead to this morbid secretion are almost uniformly of a more or less asthenic character, and as the secretions poured out during the continuance of asthenic fever or inflammation rapidly suffer decomposition, the changes which the adventitious coating just described undergoes, and the fetor thereby produced, often lead to the mistaken belief that mortification or sloughing has taken place. It is, however, many years ago since it was proved that such an event was of extremely rare occurrence, and that even in the most suspicious cases, on forcing away the morbid secretion, the mucous membrane itself would be found unbroken. Superficial ulceration is occasionally met with, actual sloughing very rarely.

Causes.—This modification of inflammation chiefly affects, and appears in many instances to be connected with, a scrofulous or rickety habit of body, or with that cachectic state of the general constitution which results from previous acute diseases, from poverty and privation, and from a residence in low, damp, or otherwise unwholesome situations. It has also appeared in some instances to be connected with an epidemic influence, and under the form of *Scarlatina maligna* is decidedly contagious. It now and then supervenes symptomatically in small pox and measles, and we have seen something very like it toward the fatal termination of phthisis pulmonalis, and some other chronic disorders.

Diagnosis.—The history, symptoms, and appearance of the throat will in general render the diagnosis sufficiently easy; it must not, however, be confounded with the pustulation of small-pox, with the merely aphthous condition of the throat attendant on chronic diseases, or with a condition of parts closely resembling it, which may arise from the injudicious use of acrid gargles in the more ordinary in-

inflammations of the throat, or in those symptomatic of mild scarlatina, or of small pox and some other disorders.

Prognosis.—When the disease presents itself in Scarlatina maligna, the prognosis is at all times unfavourable; it is necessarily more so when it occurs in the advanced stage of such chronic disorders as phthisis pulmonalis; but of course, when merely symptomatic, the prospect of recovery will depend upon the nature and circumstances of the particular disorder in which it occurs, and of which it then forms a part. In every instance, whether idiopathic or symptomatic, the danger is infinitely increased by the inflammation and false membrane extending to the larynx. When purely idiopathic, the prognosis is to be formed from a due consideration of the age and constitution of the patient, the severity of the attack, the sthenic or asthenic character of the local and general symptoms; and the presence or absence of laryngeal complication.

Treatment.—The treatment applicable to the morbid condition of the throat, under discussion, as met with in Scarlatina maligna, will of course be pointed out in its proper place. In those more rare instances in which this affection appears to be idiopathic, the remedies, both as regards activity and kind, must necessarily be varied according to the circumstances of the individual case. When active inflammation is present, when the attendant redness is of a vivid hue, when the patient is young and of moderately good constitution, and especially when symptoms of inflammatory fever are present, moderate general depletion may undoubtedly be employed; but should the constitution be bad, the strength reduced, the local inflammation slight, the redness of a deep or livid hue, and the constitutional disturbance inconsiderable or altogether absent, or if present of a decidedly asthenic character, leeches to the external throat may be substituted for gene-

ral blood-letting, the discharge being encouraged afterwards, if necessary, by hot sponging, or by the application of a warm poultice. In still milder cases a blister may be tried, or it may probably be sufficient to apply a mustard poultice to the neck for a quarter or half an hour, two or three times a day; or the neck may be freely rubbed as often, with a stimulating and anodyne liniment, composed of an ounce of lin. ammoniæ and two drachms of laudanum. In every instance the bowels should be freely evacuated of their contents, for which purpose calomel and rhubarb, in proportions suited to the age of the patient, constitute perhaps the best form of purgative.

As soon as the question of depletion has been determined, and the bowels freely relieved, an emetic, especially of the antimonial kind, has been recommended; but if the powers of the patient be weak, the ipecacuanha, as being less depressing, may be substituted. The subsequent treatment must depend entirely upon the peculiarities of the case; when the inflammation is active, and the constitution comparatively good, calomel may be given in small and frequently-repeated doses, or mercurial inunction may be employed to bring the system under the specific influence of the mineral. Half a grain or a grain of calomel, according to the age, either alone or with two or three grains of extract of eonium or extract of hyoscyamus, may be given every two or three hours; or half a drachm or a drachm of strong mercurial ointment may be rubbed into the thighs and legs twice a day, a small portion being at the same time placed in each axilla. Together with these remedies, the patient may be put upon slops and take mild diaphoretics, such as the liq. ammon. acet. mixture, with a few minims of vin. ant. pot. tart., or vin. ipecacuanhæ to each dose, three or four times a day. In proportion as the strength fails, or the disease assumes

an asthenic form, the diet must be improved both in quality and quantity, consisting of arrow-root, beef-tea, and perhaps a certain allowance of wine; exhibiting at the same time medicines of the tonic or stimulant class, such as infusion of serpentary, quinine, decoction of bark, and ammonia.

As regards the local treatment of the internal throat, it is considered to be much the same, whether the complaint be idiopathic or symptomatic. Gargles have been declared to be nearly useless; instead of which it has been recommended to moisten the false membrane twice or thrice a day with concentrated hydrochloric acid, or with a solution of nitrate of silver, of the strength of 20 grains to an ounce of distilled water. Powdered alum has also been recommended, and is perhaps preferable, when, with a false membrane, the inflammation appears to be of a somewhat active kind. When the membrane extends to the larynx and bronchi, threatening suffocation, laryngotomy or tracheotomy presents the only, though but a forlorn, hope of saving life.

CYNANCHE PAROTIDEA, PAROTITIS, MUMPS, OR BRANKS.

This is a specific disease, which is occasionally epidemic, and decidedly contagious. It is for the most part a disorder attended with little or no danger, except in those rare cases when a metastasis takes place to the brain. It may or may not be preceded by rigors or shivering, and usually commences with a small and more or less circumscribed inflammatory swelling about the angle of the lower jaw, which gradually increases till it involves the whole of the region of the parotid and submaxillary glands, and produces considerable tumefaction of the cheek and upper part of the neck of the side affected. The swelling may attack one side only, or, what is more common, it may attack both, either simulta-

neously or in succession. It is remarkably firm and elastic to the feel, and is accompanied by redness and tenderness of the parts, pain on moving the jaws, occasionally by some difficulty in swallowing, and by slight febrile disturbance of the system at large. Commonly, in four or five days, the constitutional symptoms, together with the pain, swelling, heat and redness, begin to subside, and in two or three days more entirely disappear. In many instances, however, on the subsidence of the original swelling, the testicle in the male, or the mamma in the female, of the corresponding side of the body, becomes affected with tenderness, pain, and swelling; which symptoms gradually increase for some days longer, when they in their turn subside; and are, in some more rare instances, succeeded by severe pain or sense of constriction within the head, slight delirium, sickness, or other symptoms indicative of disease attacking the brain or its membranes. The injury to the testicle is sometimes permanent, and has occasionally led to the absorption of the organ.

Treatment.—The method of treatment may with propriety be considered under three distinct heads; first, that which is applicable to the disease whilst limited to the neighbourhood of the parotid gland; secondly, that which is applicable to the metastasis to the testicle or mamma; and thirdly, that which ought to be pursued in those more rare cases in which the affection of the latter is succeeded by disturbance of the brain. The treatment of the first stage, or that in which the disease is limited to the neighbourhood of the parotid, is extremely simple. In mild cases little will be required beyond the ordinary antiphlogistic diet; confinement to bed, in order to avoid exposure; an occasional brisk purge; and some gentle diaphoretic three or four times a day, such as the common effervescing draught, or the liq. ammon. acet. mixture, with the addition, perhaps, of a few

minims of vin. ant. pot. tart. The local treatment, under such circumstances, may consist simply in covering the part with a piece of fine flannel. Should the febrile disturbance, however, or the local inflammation, be considerable, it may be prudent to have recourse to one or two general bleedings, to an extent proportionate to the age and constitution of the patient. It has also been recommended, under such circumstances, to apply leeches to the swelling, followed by a fomentation and poultice; such local treatment not having been observed to favour a metastasis either from the parotid to the testicle or mamma, or from the latter to the brain.

When the testicle becomes affected, it ought to be supported, and subjected to a treatment corresponding [with that pointed out as applicable to the parotid; whilst, if the febrile symptoms be aggravated, it will be necessary to subdue them by bleeding, purging, diaphoretics, perfect rest, and a strict observance of the antiphlogistic regimen.

Should the brain become involved, on the subsidence of the pain and swelling of the testicle or mamma, together with more active bleeding and purging, it will be prudent to shave the head, and to apply cupping-glasses to the nape of the neck, or leeches to the temples. In other cases, a blister to the neck, and a cold evaporating lotion to the shaven scalp, may be sufficient. No means have been found successful in recalling the inflammation to its former seat • after it has once left it and attacked another part.

PERITONITIS.

By PERITONITIS is meant an inflammation affecting the serous membrane which envelops and sustains the viscera, and lines the parietes of the abdomen. It is usually divided into the acute and chronic; either of which may be general, or only partial.

ACUTE PERITONITIS.

The symptoms of acute peritonitis, although sufficiently well marked in ordinary cases, are nevertheless considerably modified by the nature of the cause producing it, by its extent, and by the state of the patient's constitution at the period of attack. An ordinary general peritonitis occurring in good constitutions, is commonly but not always preceded by rigors or shivering, a sense of debility, and paleness of the countenance, presently followed by an acute, pungent, or burning pain in some part of the abdomen, which gradually extends itself over the whole of the abdominal region. This pain is greatly aggravated by pressure—the mere weight of the bed-clothes, by coughing and sneezing, the act of vomiting, by the efforts at stool, and, in short, by whatever has the effect of moving or agitating the inflamed parts. In some cases, the pain is not only severe, but more or less constant; in others, it is comparatively moderate, so long as the patient is perfectly still, and not subjected to pressure; but in almost every instance, occasional aggravations, of longer or shorter duration, are experienced, apparently from the accidental movement of flatus within the bowels. The patient usually lies upon his back, with the thighs and legs flexed; by which position he lessens the pressure of the abdominal muscles upon the inflamed parts. Respiration is quick and short, and is chiefly performed by elevating the ribs; the descent of the diaphragm tending to increase the pain: the face is pale, and the features are often so drawn, as to impart to the countenance a remarkably characteristic expression of distress; the bowels are generally costive; the patient complains of giddiness or headache, and thirst, and frequently experiences a sense of nausea, or even actual vomiting, of a colourless, or greenish bilious-looking matter, especially if the upper part of the

abdomen happen to be much involved; the tongue is white, and slightly furred; the skin generally hot and dry; the urine scanty, and the pulse frequent and sometimes contracted, but nevertheless hard and resisting to the finger. As the disease advances, the intestines seem to lose their tone; they become tympanitic; the abdominal muscles appear as if they were spasmodically tightened, producing a more or less tumid and rigid condition of the whole belly: in some instances, however, the belly, though slightly rigid, remains nearly quite flat throughout the whole course of the disorder. If the disease still advance, the firmness and resistance of the abdominal muscles usually yield to a greater or less degree of relaxation; the whole abdomen feels softer, but nevertheless more doughy and massive than natural; and at a still more advanced period, with this more flaccid tumefaction a distinct fluctuation may occasionally be felt. Should the disease pass on to a fatal termination, the tympanitic distention of the belly often returns; the features appear shrunk and cadaverous, the extremities get cold, the pulse becomes rapid, small, undulating, and sometimes irregular, and the voice feeble; the pain ceases; the sickness, if it prevailed before, is perhaps more incessant; the contents of the stomach are rejected, or rather seem to regurgitate, with scarcely any effort; the urine and stools probably pass off involuntarily; delirium or stupor supervenes; the prostration is extreme, and the patient expires.

When fatal, such an attack may occupy a period of from three or four days to as many weeks. A patient has sunk from a general peritonitis in less than forty-eight hours from the first invasion; but such cases are comparatively rare, except in very bad constitutions. When, on the contrary, the disease terminates favourably, the countenance assumes a more natural appearance; the pain and tenderness of the abdomen gradually diminish, the patient is able to change

his position in bed without much suffering, the pulse gets softer, slower, and fuller, the sickness abates, the stomach retains the ingesta, the bowels act spontaneously, or respond to medicine, and the patient passes into a state of convalescence, which, although usually protracted, varies, nevertheless, in duration, in different cases—occupying, perhaps, a period of from one to three months. The earlier the disease has been checked, the more rapid will be the complete recovery of the patient.

When acute peritonitis attacks very old people, or persons whose constitution has been brought into a cachectic state by long-continued want and privation, by intemperance, by protracted suppuration, or by visceral disease, although the local pain may be less urgent and distressing, or even altogether absent, when the disease is said to be *latent*, the general symptoms are nevertheless very commonly much more alarming, and are apt to assume a good deal of a typhoid character. The rigors and shivering are succeeded by a hot and dry skin, a frequent, small, and compressible, though perhaps a hard pulse, a dry, brown tongue; the general prostration is great, and the disease often proves fatal in two or three days, or probably in little more than twenty-four hours from the first attack.

When acute peritonitis is produced by extravasation into the peritoneal cavity, as may take place from rupture of the stomach, an intestine, an abscess, or the urinary or gall-bladder, the patient is occasionally, but not always, sensible of something having given way within him, and immediately experiences intense pain, which is rapidly diffused over the whole of the abdominal region. The extreme and sudden depression of strength strikingly attests the powerful shock given to the constitution: the countenance quickly becomes pale and haggard, the pulse rapid and small, though perhaps hard: the patient suffers from

distressing nausea or vomiting; the bowels are generally constipated; there is often but little reaction, so that the heat of skin may be very inconsiderable; on the contrary, the temperature soon falls below the natural standard; the extremities get cold; clammy, cold sweats break out; the pain ceases; the stomach with little effort returns whatever is taken into it; the voice gets feeble; and stupor or delirium closes the scene;—the duration of such a case usually varying from twenty-four hours to two or three days. The prolongation of life, however, will depend, to a certain extent, upon the nature of the matter extravasated, and the particular part at which the extravasation has taken place; those cases being the most rapidly fatal in which the extravasated matter is of a very acrid quality, and in which, from its consistency, and from the point of extravasation, it can be quickly diffused over the whole of the peritoneal surface: and hence, probably, the rapid fatality of cases depending upon rupture of the stomach.

When obstruction takes place in a hernia, it often happens that the patient experiences a considerable degree of a dragging, but ill-defined pain, chiefly referred to the epigastric region, and accompanied by much tenderness over a large portion of the belly. Unless relieved, this condition may undoubtedly pass into actual peritonitis; or it is even possible, that actual peritonitis may occur from such physical obstruction of the bowels, without being preceded by the above symptoms. In either case, the pain and tenderness characteristic of inflammation of the peritoneum will, of course, be first detected in the neighbourhood of the stricture; from whence it may spread to the rest of the abdomen, accompanied or even preceded by the obstinate constipation, the remarkable irritability of stomach, and distressed expression of countenance, so uniformly present in physical obstructions of the bowels in general. Cases, how-

ever, of general peritonitis from such a cause are not very common.

PUERPERAL PERITONITIS.

This term of itself merely expresses peritonitis occurring in the puerperal state: it is nevertheless a term which has been rendered of very equivocal import, in consequence of its having been employed by some writers to designate not only simple peritonitis, but several other more formidable disorders incident to the puerperal state in which peritoneal inflammation occurs incidentally as a mere part or symptom. In this way it has been regarded as almost synonymous with puerperal fever,—a term scarcely less vague and objectionable. Suffice it to say, that simple peritonitis is by no means of uncommon occurrence in the puerperal state; the patient, two, three, or four days after delivery, being probably seized with rigors or shivering, followed by pain and tenderness in the region of the uterus, which gradually extends to the rest of the abdomen. The lochiæ are usually suppressed or diminished, and the mammæ probably cease to secrete milk; but in other respects the disease does not, either in its effects or progress, materially differ from the ordinary acute peritonitis already described. When, however, a puerperal patient has the misfortune to be assailed by inflammation of the uterine veins, we may indeed have peritonitis developed; but it then merely constitutes one of the numerous local affections which are observed to result from phlebitis wheresoever it occurs, and will be rendered sufficiently manifest, in general, by the high degree of constitutional irritation present, by the great prostration of strength, by the typhoid character of the constitutional symptoms, by the indications of local inflammation set up in the serous membranes of the chest or brain, the

tendency to inflammation and abscess in the subcutaneous cellular tissue, by the pain and swelling of the joints, or other well-known consequences of this alarming, and, for the most part, fatal disease. Nearly the same remarks will apply to those cases in which peritoneal inflammation occurs as a mere symptom of a condition induced by an animal poison.

Of course, when peritonitis is only *partial*, the pain will necessarily be circumscribed, whilst the rest of the symptoms will be determined by the situation of the inflammation, or by the nature and importance of the particular organ covered by the inflamed membrane, as will be more fully pointed out in another part of this work.

Morbid Appearances.—The morbid appearances found on inspecting the bodies of those who have died with acute peritonitis, vary according to the violence and extent of the inflammation, the period of the disorder at which death took place, the previous state of the constitution or habit of body, and the nature of the exciting cause. Although it is said that the first effect of inflammation of a serous membrane is a dryness or lack of secretion, the appearances earliest observed in ordinary cases, are more or less flatulent distention, with a high degree of vascularity, and consequent redness of the intestines; the redness being most intense, and presenting itself in streaks in those situations where the folds of the intestines come in contact with each other. In a case which proved fatal in about twenty-four hours, very little beyond these appearances was found, but the inflammation had been very extensive. In general, however, even at a very early period, with a fine injection of vessels, we find the intestines presenting a certain degree of opacity, and to the touch feeling thicker and more massive or substantial than natural. They are also very commonly smeared with a viscid or clammy matter, which may often be scraped

off with the edge of the scalpel, and which causes the intestines to move sluggishly over each other. It is still more common to find, in addition to these changes, more or less effusion of serous and albuminous matters, in variable proportions and of variable aspect. When the disease occurs in good constitutions, as usual, the proportion of solid albumen is large, of a whitish or pale yellowish colour, whilst the fluid part of the effusion presents a milky appearance, from an intimate admixture of small grains or shreds of solid albumen with the serum. The solid albumen is chiefly observed occupying the angles formed by the convolutions of the intestines; but sometimes, when very considerable, covering a large portion of the intestines themselves. It varies in its consistency—so much so, that in some instances it passes gradually and insensibly from the consistency of butter, to that of a fluid puriform-looking matter, which, with the serum, gravitates into the cavity of the pelvis; or, if the dead body lies on the back, towards the spine. If the case have proved fatal at a later period, we find that the serum has been absorbed, and that the remaining solid albumen forms an intimate but still easily lacerable bond of union between the different folds of the intestines, and between the inflamed intestines and other parts with which they may happen to be in contact. In tearing asunder these adhesions, we occasionally discover in certain parts, but especially in the angles of the intestines, a collection of puriform or serous fluid, which had been enveloped by the solid albumen, or lodged between it and the structures beneath. In other instances, parts more or less remote from each other are found connected, through the medium of processes or bridges of solid albumen stretching across between them. At a later period the albuminous matter takes on organization, and is converted either into a more or less transparent and smooth covering to the natural

serous membrane, of variable thickness; or into a cellular tissue, which firmly binds together all the adjacent parts over which it has been effused. When the completely organized albumen forms merely a thin covering to the natural membrane, it is often nearly transparent, and is scarcely to be distinguished from the natural structure, the secreting function of which it performs—becoming, in short, a serous membrane, liable to the ordinary changes and diseases incident to serous membranes in general.

In some rare cases a very considerable quantity of solid albumen is poured out, and so completely overspreads the anterior surface of the intestines, that, on becoming organized, it completely incloses them as in a cyst; so that in cutting through the abdominal muscles and peritoneum, instead of finding the usual appearance of the peritoneal cavity, we discover a rounded tumor, on dividing the parietes of which, we discover the intestines inclosed within it.

As in pleurisy, these various albuminous deposits, on becoming organized, contract, and produce effects which differ according to the form and situation of the adventitious structure. When uniformly spread over the surface of the intestines and mesentery so as to form a new membrane, its ultimate contraction has the effect of thickening the parietes, and lessening the calibre of the intestinal tube, and, with an increase of thickness, so shortening the mesentery, that the intestines are drawn back towards the spine. When the deposit between the intestines contracts, it often binds them so intimately together as to render it quite impossible to unravel them; this state being sometimes almost universal, at other times only partial. When, on the other hand, distant parts are connected by albuminous bands or bridles, they, on contracting, occasionally encroach so much upon the intestinal tube, as sooner or later to give rise to symptoms of strangulated hernia. Again, when a quantity of

puriform or serous fluid is inclosed in a mass of albumen, and fails to be absorbed, it sometimes happens that at a period more or less remote it finds its way into the peritoneal cavity, excites inflammation either in the peritoneum or in the new membrane spread over it, and has been known in this way to prove fatal. Of course, when fatal peritonitis has been produced by extravasation into the peritoneal cavity, we must expect occasionally to find more or less of the extravasated matter mixed with the morbid products.

When acute peritonitis proves fatal to the aged, or to persons of a cachectic habit of body, whether from intemperance, or protracted ill health; or when it occurs as a part or symptom of a disease in which the nervous system is temporarily depressed, as in phlebitis; the state occasionally induced by an animal poison; and in typhoid conditions in general; we find after death appearances very different from those described as occurring in good constitutions and in diseases of a more purely sthenic character. The proportion of solid albumen is small, and that of the least organizable or almost puriform kind; whilst the proportion of serum is large, and of a turbid, dingy, and greenish or brownish colour, or sometimes reddish, from an admixture of blood.

Terminations.—Acute peritonitis may terminate in a more chronic form of the disease. A consideration of the morbid appearances will sufficiently explain what have been called its terminations, in *adhesion*, *effusion*, and *suppuration*. When the disease quickly subsides, without leaving behind it any appreciable change in the inflamed parts, it is said to terminate in *resolution*; a mode of termination which we believe to be rare—more or less of serous or albuminous effusion probably taking place in most instances. *Mortification* from ordinary peritonitis is seldom or never met with; this effect of peritoneal inflammation being limited

to those cases which depend upon or are combined with mechanical violence or obstruction.

Causes.—A predisposition to the complaint appears in some instances to depend upon a peculiar but inserutable idiosyncrasy inherent in certain individuals, or upon an equally unknown epidemic condition of the atmosphere. Like other inflammations, it is most frequently met with in irritable and plethoric subjects during the early and middle periods of life, and especially when such persons are, from the nature of their occupation, much exposed to sudden and considerable vicissitudes of temperature: it is nevertheless more common amongst females than males, apparently from their greater susceptibility of impression, and from their great liability to a sudden check or suppression of the menstrual discharge. A strong predisposition to inflammation of this and other serous structures is pretty uniformly found in connexion with mottled kidney; and it is not unfrequently observed to accompany congestion and other diseases of the liver. It has also been supposed that an irritable state of the bowels, an unhealthy condition of the abdominal secretions, and the state of the peritoneum after delivery or tapping, favour the development of the disorder.

Exciting Causes.—It must be acknowledged that the disease occasionally occurs without our being able to discover any exciting cause whatever. It may be induced by cold and damp, applied either to the body generally or to the feet and legs in particular. It may be produced by mechanical violence, by a hernia, or other obstruction of the bowels; by rupture of the stomach, of an intestine, of the urinary or gall-bladder, or of an abscess in some part of the abdomen; by ulceration of the intestines; or of the vermiform process of the cæcum; by diseased mesenteric glands; by suppression of the menstrual discharge; by the

irritation or rupture of an ovarian or hydatid cyst; by an aneurism; by an extra uterine conception; by a suddenly-checked diarrhœa; by fistula in ano, or surgical operations performed on the genitals or parts about the pelvis. It is often excited by phlebitis, and occasionally by a mineral or animal poison: it may supervene in the progress of the various forms of idiopathic fever, or of febrile disorders in general, but especially the exanthemata; and it is said to result now and then from a metastasis of gout, rheumatism, or erysipelas.

It has been asserted that puerperal peritonitis is communicable by contagion; but although an apparently contagious disorder incident to the puerperal state is pretty uniformly accompanied by inflammation of the peritoneum, it is extremely doubtful whether it can fairly be regarded as an original and legitimate peritonitis, it being more than probable, that when contagion appears to propagate peritonitis, it does so merely by spreading a disorder, of which peritonitis forms a part or symptom; but whether such contagious puerperal disorder result from phlebitis, from disorganization of the uterus, from the poisonous influence of putrid matters lodged in the latter viscus, or from some other but unknown source within the body, remains to be determined by future investigation. Ordinary peritonitis, commencing in the region of the uterus, is by no means uncommon in the puerperal state, but the symptoms are usually very different indeed from those observed in the disorder reported to be contagious.

Diagnosis.—Whenever a case occurs in which symptoms of derangement of the stomach or bowels constitute a prominent feature, it ought steadily to be borne in mind that they may possibly arise from accidental or wilful poisoning, from a hernia, or from some mechanical injury concealed or disregarded by the patient. As acute peritonitis, with a

few very rare exceptions, is characterized in an especial manner by severe pain, it has not unfrequently been confounded with other disorders which are either uniformly or only occasionally accompanied by pain. The principal of these are, enteritis, or inflammation commencing in the mucous membrane of the intestines; colic; the neuralgic pains of the belly chiefly incident to nervous and hysterical females; tympanitis; and rheumatism of the abdominal muscles.

Enteritis, or *muco-enteritis*, as it is sometimes called, may be associated with peritonitis, or it may exist alone: in the latter case, although much pain and tenderness may happen to be present, it will nevertheless, in a majority of instances, be readily distinguished from peritonitis. The pain in enteritis is not of the pungent and burning, but rather of the griping kind; the tenderness on pressure is by no means so exquisite; so that, by observing great caution, the hand may often be applied with considerable firmness, without causing much suffering; neither does the patient experience so much distress on moving the body, or from the act of breathing, coughing, or straining at stool; the tongue is usually red, either in its whole substance or at its tip and edges; the pulse most frequently soft and compressible; there is often flushing of one or both cheeks; the skin is in general neither very hot nor very dry; and a diarrhoea is commonly, though not always, present; the prevalence of this symptom depending much upon the part of the intestine affected.

In *colic*, as in peritonitis, there is pain in the belly, increased at intervals, with paleness of the countenance, a sense of debility, and frequently nausea or vomiting; but acute peritonitis is commonly preceded by rigors or shivering—which is not the case in colic. In peritonitis the febrile symptoms are more or less urgent; they are not ob-

served in ordinary cases of colic; the pain of peritonitis, though liable to occasional increase and diminution, is nevertheless pretty constant, and of a pungent or burning kind; in colic the pain is rather of a griping or twisting character; is chiefly felt about the navel; occurs in paroxysms, with intervals of ease; and is rather relieved than aggravated by pressure, unless it has lasted for some time, when a general tenderness is now and then complained of.

In *neuralgia* of the abdomen, as in peritonitis, there is often exquisite pain, which is greatly aggravated by the slightest pressure; but neuralgia is seldom preceded by rigors, or followed by any considerable degree of febrile disturbance. We do not discover the peculiar expression of countenance so remarkable in peritonitis, nor is nausea or vomiting so certainly present. Neuralgia occurs almost exclusively in nervous and hysterical females, and in those especially who suffer much from painful irregularities of menstruation; whilst a careful inquiry will generally make it appear that the patient has not only suffered from painful menstruation, but has probably experienced somewhat similar pains before; that she has had once or oftener a pain under the left mamma, with palpitation, or some other pain or symptom manifestly attributable to hysteria. The pain occasionally remits, or even disappears, and returns again after a short interval; and although much increased by rude pressure, sometimes admits of a moderate degree of it, when cautiously and slowly applied; which is not the case in peritonitis. In general the pain is more complained of by the patient whilst perfectly quiet, in neuralgia, than in peritonitis; so that the very intensity of the pain, when it occurs in young females, ought at all times to excite suspicion. A due consideration of all these circumstances, coupled with the unsteadiness and incongruity of the symptoms usually met with in hysterical subjects, will seldom leave much doubt as to the

real nature of the case. Should, however, a doubt exist, as will now and then happen, prudence requires that the treatment applicable to inflammation should be adopted.

A similar neuralgic pain sometimes occurs shortly after delivery, even in persons not remarkably hysterical, either from suppression of the lochia or merely from an unknown sympathy existing between the uterus and the parts affected.

As a *tympanitic* state of the abdomen is often present in peritonitis, an erroneous diagnosis may very probably be formed when tympanitis occurs, independently of inflammation, and happens to be accompanied by considerable pain and tenderness. In general, however, it may be distinguished readily enough by attention to its history; by the absence of febrile symptoms; by the expression of the patient's countenance; by the feel, sound, and size of the abdomen; by the ordinary indications of flatulence; by the character of the pain, and the effects of pressure. Such cases most frequently occur in irritable females, and are then found to be very closely allied to the neuralgic affection just described.

Rheumatism of the abdominal muscles is to be distinguished from peritonitis by the history of the case; by the sense of debility being less; by the absence of sickness; by the furred and white, but moist or milky tongue; by the full and strong pulse; by pains existing probably in other parts; by the pain following the course of the muscles; by their great aggravation on attempting to move; and by their being comparatively little increased by cautious though firm pressure.

An *over-distended bladder* has been mistaken for peritonitis; and, on the other hand, peritonitis attacking the serous covering of the bladder, has been mistaken for original disease of this organ, or for obstruction in some part of the

urethra, in consequence of the great difficulty of voiding urine, occasionally experienced under such circumstances.

A *distended gall-bladder*, the *passage of a gall-stone*, or the *irritation of a calculus in the kidney or ureter*, may lead to a suspicion of a partial peritonitis: when, on the contrary, inflammation attacks the mesentery, it may give rise to symptoms more or less resembling those of *diseased kidney*, *lumbago*, or *lumbar abscess*.

The several varieties of peritonitis, depending upon the nature of the cause producing them, may often be recognized readily enough by the symptoms which have already been pointed out as peculiar to each.

Prognosis.—Acute peritonitis is at all times a dangerous disease, sometimes proving fatal, even in moderately good constitutions, in the short space of from twenty-four to forty-eight hours. The prospect of recovery, however, in any case must be estimated by the severity of the attack, the period at which medical aid is procured, the state of the patient's constitution at the time, and by the nature and degree of the predisposing and exciting causes. When the patient is young, or little beyond the middle age, of good constitution and temperate habits; when, consequently, the general symptoms are of a highly sthenic type, and when active treatment is early applied, there will be good grounds for hoping that the patient will recover. When, on the other hand, the disease, though acute, has been early neglected, and the inflammation permitted to proceed uninterruptedly, and thereby to produce extensive effusion, and other important changes in the inflamed parts; when the patient is old, of cachectic constitution and intemperate habits; and when, in consequence, the general symptoms assume an asthenic or typhoid type, the chances are pretty uniformly against recovery. In the progress of any individual case,

the favourable circumstances are, the inflammation being only partial, and chiefly attacking the lower part of the abdomen; the absence of vomiting, the stomach being able to retain food and medicine; the gradual subsidence or diminution of the fever and local pain under the use of remedies; the expression of distress in the countenance becoming less apparent, and the breathing less hurried; pressure producing less pain; the patient being able to change his position with less inconvenience; the pulse getting softer, slower, and fuller; the skin being bedewed with a warm and gentle moisture; a lateritious deposit in the urine, and occasionally a moderate diarrhœa. On the other hand, the unfavourable circumstances are, the inflammation being general, and involving the upper part of the abdomen; constant nausea or vomiting, the stomach being unable to retain food or medicine; great paleness and distress of countenance; exquisite pain in the abdomen on pressure, or on moving the body; the constantly supine position, with the legs and thighs flexed; quick and short, costal breathing; and especially a very rapid and small pulse. When the countenance gets haggard; when partial cold sweats break forth; when the extremities become cold; when the contents of the stomach regurgitate with little effort; when the pain ceases; when the pulse gets small, creeping, and thready; stupor or delirium for the most part supervenes, and death soon closes the scene;—death perhaps most frequently happening in from three or four to ten or twelve days from the first attack. When, however, there is considerable effusion, the patient will sometimes continue in a state of greater or less prostration, with occasional flushing of one or both cheeks, quick pulse, and other symptoms of irregular hectic for an uncertain period; and either die at last completely exhausted, probably in three,

four, or five weeks; or gradually, but very slowly, pass into a lingering convalescence, perhaps of many months' duration, and ultimately recover.

When the disease results from extravasation into the peritoneal cavity, although some slender hope may occasionally be founded upon the less irritating quality of the matter which happens to be extravasated, or upon the possibility of the extravasation being limited to a part only of the abdomen, in certain cases, the prognosis is always extremely unfavourable, and for the most part utterly hopeless. We have known one case of recovery from extravasation from an intestine; and, in not a few instances, the rupture of a serous cyst, or even a malignant ovarian cyst, into the cavity of the peritoneum, has failed to destroy life.

Treatment.—The chief part of the treatment consists in general and local depletion, and as speedily as possible bringing the system under the specific influence of mercury. The freedom and repetition of general bleeding must of course be determined by the age and constitution of the patient, and by the effect produced. When the patient is young, and of good constitution, he should be placed in the semi-erect position, and bled from a free orifice, not to absolute syncope, but until manifest signs of faintness appear; immediately after which, if the stomach will retain it, four or five grains of calomel, and a grain or a grain and half of opium may be given, and repeated in somewhat smaller quantity, every four or five hours afterwards; probably two of calomel and one of opium may be sufficient. Should the calomel, notwithstanding its combination with opium, irritate the bowels and produce diarrhoea, we may endeavour to counteract this by giving the chalk mixture, with or without the tincture of catechu, with each dose of the pills, or oftener. Should this fail to quiet the bowels, or

should obstinate vomiting prevail, mercurial inunction ought to be substituted, a drachm of the stronger mercurial ointment being carefully rubbed for half an hour over the thighs and legs thrice a day, placing at the same time about a scruple of the ointment in each axilla, in order to hasten the mercurial action.

If the febrile symptoms and local pain still continue urgent, and the buffy coat and firm crasis of the blood indicate that active inflammation is associated with considerable power, the bleeding may be repeated in the same manner after eight, ten, or twelve hours; always remembering that the state of the pulse is often of itself extremely fallacious in this disease, and that although perhaps small and contracted, and apparently contra-indicating depletion, it will generally become fuller after a quantity of blood has been taken away. Besides general depletion, the application of ten, twenty, thirty, or even forty leeches to the belly, according to the circumstances of the case, will often be followed by the most marked relief; their application being followed or not by a poultice or fomentation, as the strength of the patient shall indicate. At an early period of the disease, blisters and all counter-irritants are highly objectionable, as they necessarily very much obscure the case by irritating the surface, and thereby rendering it impossible to determine by pressure how far we have succeeded in subduing the inflammation. It is, therefore, only some time after the disease has been checked, and when the pain appears to remain more or less fixed in a part, that blisters, mustard poultices, turpentine, or croton oil, and such like irritants, can with propriety be employed; instead of which, hot fomentations or poultices, if they can be borne, will always be found unobjectionable and beneficial. Leeches are not altogether free from the objection stated; but when proper address is observed in conducting an examination,

we can generally, by making pressure in the spaces between the leech-bites, satisfy ourselves of the actual degree of tenderness of the internal parts. As regards the state of the bowels, if not moved by the combination of calomel recommended above, it is perhaps better to abstain altogether from the internal administration of cathartics until the violence of the disease has been greatly subdued, and until the milder operation of glysters has afterwards failed. At this later period the senna and salts may be given in divided doses until it operates, provided the stomach will retain it. In some cases, half an ounce or six drachms of castor oil will have the desired effect.

In addition to these remedies, a strictly antiphlogistic regimen must be observed, the patient confined to bed, and almost entirely deprived of food for two or three days, or only the blandest and least nutritious fluids allowed in small quantity. If the disease be much protracted in consequence of the extent of effusion as indicated by fluctuation, by the doughy feel, and soft tumefaction of the belly, and by obscure symptoms of hectic fever, a more nutritious diet must of course be allowed, consisting of such articles as arrow-root, sago, beef-tea, and animal jellies; employing, at the same time, mild diuretics, such as the tincture or infusion of digitalis with nitre; or the compound infusion of roses, as a refrigerant; or, unless the perspiration be in excess, the liq. ammon. acct. mixture may be substituted, with digitalis and the spt. æther, nitric and acetate of potash. Of course, it will often be necessary, in the progress of convalescence, to administer a gentle laxative from time to time, as well as anodynes, to procure repose at night. The absorption of the effused fluid, and the entire removal of inflammatory action, will also be materially promoted by the repeated application of a blister, or of the turpentine, or other stimulating liniment, to the parietes of the abdomen.

When acute peritonitis occurs in the aged or cachectic, and when it assumes much of the asthenic or typhoid type, general depletion must be used very sparingly; an attempt being made, by placing the patient upright, to induce faintness by as small a loss of blood as possible. It will seldom admit of repetition; instead of which, we must substitute leeches, blisters, and calomel and opium in moderate doses; together with a somewhat liberal allowance of nutriment.

When the disease arises from extravasation, the prostration is so sudden and extreme, that depletion is for the most part out of the question; but although the case is all but hopeless, it will be right to attempt to lessen the frightful and overwhelming irritation by the free administration of solid opium; and if the stomach will retain it, to support the strength by means of mild, nutritious food.

CHRONIC PERITONITIS.

Chronic, or, perhaps, more properly speaking, *subacute* peritonitis, may be a mere result or sequel of the acute form of the complaint, when its existence and progress are for the most part sufficiently manifest. In a majority of instances, however, it is an original disease, when both its commencement and its subsequent progress are apt to be involved in considerable obscurity. It is highly probable, if the patient were in every case of sufficiently mature age, and attentive to his feelings, that we should find the ordinary forms of chronic peritonitis commencing with rigors, shivering, pain, and other general and local symptoms, corresponding in kind, though not in degree, with those of the acute disease. It most frequently happens, however, either from the youth and inattention of the patient, or from the inconsiderable degree of inconvenience which often results from this form of perito-

nititis at its commencement, that we do not¹ succeed in obtaining a very satisfactory history of the case; and hence it is, that we not unfrequently have some difficulty in satisfying ourselves whether we are called upon to treat a new, or only an incidental aggravation of an old disease. In either case, we for the most part find symptoms which, as already observed, differ rather in degree than in kind from those of acute peritonitis. The patient has probably experienced rigors, chilliness, or shivering, with a general feeling of indisposition, weakness, and loss of appctite, accompanied or presently followed by pain in some part of the abdomen: this pain is seldom complained of over so large an extent of surface as in acute peritonitis; but, like the pains of the latter, it is aggravated by pressure or motion, and is sometimes observed to dart or shoot in various directions; the belly is usually more or less tympanitic; but whatever may be the degree of distention, the abdominal muscles generally, and particularly those situated over the tender part, are commonly somewhat rigid, or contracted to the feel. Unless the patient be naturally of a very florid complexion, the countenance is generally pale, with an expression of distress—the latter being rendered much more obvious on any attempt being made to press the abdomen. The patient complains of thirst, perhaps with nausea, or even vomiting; the matter vomited consisting either of the ingesta, or of a mucous or green, bilious-looking matter; the pulse is frequent, and perhaps small, but nevertheless hard and resisting; the tongue, at its centre and base, is covered with a whitish fur; the skin is hot and dry; the urine scanty and high-coloured; and the bowels generally costive. As the disease advances, considerable effusion occasionally takes place, rendering the belly tumid and soft, or doughy; but whether in this state, or highly tympanitic, a distinct fluctuation may now and then be felt. The symptoms enu-

merated, and, if there be much effusion, probably an irregular form of hectic, will often continue, with variable intensity, for several weeks, or even months, then prove fatal; or, though neglected, gradually subside. When properly and successfully treated, they usually disappear in a period varying from ten days to six weeks.

After recovery from such an attack, the patient is usually left pale, weak, and more or less emaciated, but without any very observable alteration either in the form, size, or feel of the abdomen. Occasionally, however, the abdominal muscles are found to have become permanently somewhat rigid and less moveable beneath the integuments, or the abdomen itself presents some irregularity of shape, or even an obvious hardness is felt in a particular spot, as if from a deposit or thickening in the interior. The disease may never return; but, in a considerable proportion of cases, sometimes from an assignable cause, and sometimes not, the patient experiences a second attack, probably after the lapse of several weeks, or as many months, when nearly the same assemblage and succession of symptoms are observed. It generally happens, however, that each succeeding attack displays a less degree of activity than that which preceded, whilst the tendency to a return seems to be increased; so that at length the patient can hardly be said to be at any time altogether free from complaint, but rather suffers from occasional aggravations of a now permanent disease of his peritoneum; the febrile symptoms assume a hectic character, probably with evening exacerbations and irregular sweats; the pain is either fixed, or it only subsides in one part to attack another; the abdomen is sometimes rigid, sometimes flaccid, but pretty uniformly more or less tympanitic; or, when the disease has been of long standing, we may have it somewhat rounded and prominent, and at the same time hard and rigid to the feel, as if there existed

a general contraction of the whole parietes; the body wastes, the countenance gets remarkably pale, often with a strongly-marked expression of distress; the bowels are probably relaxed or extremely irregular, being sometimes constive, at other times loose: there is occasionally vomiting, especially after taking food; the tongue is covered with a whitish fur, or is unusually red at the tip and edges, and towards the close, often remarkably clean, tender, and aphthous; the pulse is small and quick; the appetite is gradually lost; the patient lingers, and at length, after months, or even years, dies completely exhausted by repeated or long-protracted suffering. In other cases, whilst the disease is pursuing its usual tardy and tedious course, a sudden and rapid increase of emaciation takes place, which soon terminates in death; or the patient is somewhat unexpectedly cut off by a severe accession of inflammation or diarrhœa.

Morbid appearances.—On inspecting the body after death, the morbid appearances are observed to vary, not only in degree and extent in different cases, but also in kind, accordingly as there is present, or not, a tuberculated condition of the peritoneum. In both forms of the disease we find the membrane opaque, and apparently thickened over a greater or less extent of surface; and in both we discover adhesions, either between the different folds of the intestines, or between the intestines and parietes, or between the intestines and the rest of the viscera. These adhesions of course vary in extent according to the activity, duration, and frequency of previous attacks of inflammation. Associated with these adhesions, there are occasionally considerable deposits of albuminous matter, which having undergone organization, produce hard and thick masses, most commonly found in the omentum, or between the folds of the intestines. In some instances these adhesions are so

considerable and extensive as completely and inextricably to glue or bind together, not only the whole of the intestines, but the whole of the serous surfaces within the abdomen. Sometimes, on tearing asunder such of these adhesions as will admit of it, we find cavities or spaces of various sizes, containing a soft, albuminous, or puriform matter. These cavities are chiefly situated in the angles formed by the intestines; and it not unfrequently happens, under these circumstances, that not only the peritoneum, but the rest of the intestinal tunics, are so softened or ulcerated as to establish a direct communication between the unnatural cavity and the interior of the intestine. In such cases, an extravasation of feculent matter, or at least of the contents of the intestine, is found to have taken place; which, if not prevented by the adhesions forming the boundary of the unnatural cavity, is diffused over a greater or less portion of the neighbouring peritoneum, and is found mixed with the morbid products; the extravasation and consequent inflammation having probably proved the immediate cause of death. The mesenteric glands are pretty constantly found enlarged, inflamed, and sometimes in a state of suppuration, or containing a quantity of the curdy or cheesy-looking matter so commonly met with in scrofulous subjects.

It has been observed that these morbid appearances are often found associated with a tuberculated condition of the peritoneum; but it is by no means satisfactorily established how far in every instance that condition is concerned, either as a cause or effect of the inflammation. In subjects dying of various diseases, the peritoneum is often found perfectly transparent, notwithstanding the presence of great numbers of these tubercles. They are then usually about the size of a small mustard-seed, of a grey colour, and almost as transparent as the peritoneum itself, in which they appear to be imbedded: indeed it would almost appear as if they

were made up of an excess of the very substance of the membrane, for it is found impossible, in some instances, to detach them from it; and on cutting through them, they are found as it were pervading the entire thickness of the membrane, and presenting the same grey colour and uniform texture throughout. In other cases, however, the deposits appear to have taken place in the subserous tissue; whereas in others, they are in the form of small, flattish, irregular masses, somewhat loosely attached to the peritoneal surface. They often undergo remarkable changes; for, between the simpler forms described, and the ordinary appearances of a soft, suppurating, and scrofulous-looking structure, we often find in the same individual various transitions or stages in progress. It is not unreasonable to suppose, that their mere presence, or the inflammatory or other physiological condition of the parts, on which their formation depends, may favour the development of inflammation of a more active kind, as well as aggravate and modify it when produced by ordinary causes. When present, they are not only found pervading every part of the peritoneum covering the intestines and parietes, but also the omentum and the peritoneum of the several abdominal viscera; or they may be more limited, and only found scattered over particular parts of that membrane. Neither are they confined to the abdomen; for we not unfrequently discover them at the same time in the pleura, in the lungs, and occasionally in the serous membrane of the brain. The tubercles of the peritoneum, and the peritoneum itself, are sometimes stained by a dark grey or black melantic-looking matter.

Causes.—The most powerful of the *predisposing* causes is unquestionably a highly scrofulous habit of body; and of the two conditions of the general constitution already described as indicative of a tubercular tendency, that which is characterised by paleness of the countenance, long eye-

lashes, dark eyes, and a dark or muddy complexion, is perhaps the most prone to the disorder. It occurs most frequently in children of from three or four to ten or twelve years of age: it is, nevertheless, far from uncommon in adults, in whom it occasionally manifests a strongly-marked tendency to assume a malignant character. A predisposition appears in many instances to be generated by unwholesome or unnutritious diet, by residence in an unwholesome locality, or in ill-ventilated apartments; and by the caegetic condition which often results from previous disease, especially the exanthemata and hooping-cough. Unless it prove a sequel of acute peritonitis, or result from some obvious violence, the *exciting* cause often escapes observation. There is good reason for believing that some of those enumerated as predisposing often become exciting causes, and of themselves lead to the development of the disorder. When a strong predisposition exists, the disease may be induced by atmospheric vicissitudes, by general and partial exposure to cold and damp, by very slight mechanical violence, by diseased mesenteric glands, by inflammation of the mucous membrane, or other derangements of the intestines. It now and then supervenes in the progress of small-pox, measles, and scarlet fever.

Diagnosis.—This disease may be confounded with tabes mesenterica, the presence of worms, infantile remittent fever, phthisis pulmonalis; and, when accompanied by diarrhoea, with inflammation or ulceration of the mucous membrane of the intestines. Whether chronic peritonitis ever commences in the mesenteric glands may be uncertain; but undoubtedly the disease is sometimes early and almost uniformly, in its progress, complicated with some change in these glands. When disease is limited to the glands, a suspicion of chronic peritonitis may arise; for in both affections we have paleness of the countenance, emaciation, and

irregular symptoms of hectic; but the presence, in chronic peritonitis, of tenderness and pain upon pressure, and the changes in the feel and form of the abdomen already noticed, will in general sufficiently distinguish it from disease affecting exclusively the mesenteric glands. When phthisis pulmonalis is so far advanced as to create a doubt, auscultation and percussion ought at once to remove it, unless the two diseases happen to exist at the same time. In infantile remittent fever, and in the case of worms, there may be vague pains in the belly, with wasting, and irregular febrile symptoms; but here again the local symptoms are widely different from those of chronic peritonitis. The history of the case and the character of the pain will seldom fail to distinguish the disease from mere inflammation or ulceration of the mucous membrane of the intestines. It must, however, be remembered that the two affections often exist at the same time.

Prognosis.—Whether chronic peritonitis prove a mere sequel of the acute form of the complaint, or assume the chronic character from the beginning, we know that in both cases it takes place chiefly in scrofulous subjects; and as in such subjects, inflammation is at all times tedious, obstinate, and difficult of cure, the prognosis is perhaps, in every instance, more or less unfavourable. The chance of recovery, however, will be greater in proportion to the comparative vigour of the individual's constitution, the small extent rather than the inactivity of the inflammation, and the earlier period at which the proper treatment has been adopted. When there are indications of a moderately good constitution; when the patient's family are not known to be highly scrofulous; when a scrofulous tendency is not strongly marked; when the strength has not been materially impaired by previous disease, or by residence in an unwholesome locality; and when proper remedies are

early and judiciously applied, although the disease may prove lingering, and liable to frequent relapses, there will be good reason for hoping that the patient will ultimately recover. When, on the contrary, the reverse of these circumstances presents itself, the disease will for the most part sooner or later prove fatal. In any individual case, the favourable signs are, the subsidence of the pain and tenderness, with a corresponding abatement of the general or irregular febrile disturbance; a more natural aspect of the patient's countenance; the pulse getting softer and less frequent; the skin moist, and the tongue clean. The unfavourable signs are, stubbornly fixed pain in the abdomen; great paleness and distress of countenance; considerable emaciation; frequent aggravations of the local pain; symptoms of hectic; total loss of appetite; and a quick and small pulse. When a violent or obstinate diarrhœa supervenes, especially at an advanced period of the disorder, it greatly increases the danger of the case, and often renders it quite hopeless. Whenever there is a sudden and violent accession of inflammation, we must always be apprehensive that extravasation may have taken place, and, consequently, that the patient is in great jeopardy; or, should he suddenly and rapidly emaciate, it will in general indicate that some serious complication of the mesenteric glands has supervened, and that the disease will probably prove speedily fatal, in spite of all remedies, however judiciously they may be applied.

Treatment.—In conducting the treatment of this disease, the great deficiency of constitutional power, so commonly present, ought to be carefully borne in mind; for however desirable it may be to put a speedy and complete stop to the inflammation, it is beyond a doubt that much injury has occasionally resulted from the employment of unnecessarily harsh or severe measures. The treatment may be

divided into that which is applicable to the disease itself, and that which ought to be adopted after the disease has been removed, in order to prevent its recurrence. The treatment applicable to the disease itself will consist in general, but especially local depletion, fomentations, poultices, and counter-irritants; together with the internal use of a moderate quantity of mercury, diaphoretics, diuretics, and anodynes.

It is only at an early period of the disorder, when of a somewhat active character, when it occurs in comparatively good constitutions, and whilst there is more or less febrile disturbance present, that general depletion is admissible. It ought to be adopted with great caution, and carried to an extent varying from four or five to ten or twelve ounces, according to the age of the patient. The bleeding should be performed in the erect or semi-erect position, so as to make a more decided impression upon the system. It will seldom be requisite or prudent to repeat it. Immediately after bleeding, a moderate dose of calomel and opium, or of hyd. \bar{c} cretâ, and Dover's powder, should be given and repeated two or three times a day, till the system is slightly affected, or till the inflammation has been manifestly subdued. One grain of calomel, with a quarter or half grain of opium, and occasionally, if there be no sickness, a quarter of a grain of ant. pot. tart.: or, three or four grains of hyd. \bar{c} cretâ, with three or four of Dover's powder, will often answer the purpose exceedingly well. At the same time, the liq. ammon. acet. mixture, or the common effervescing draught, may be given three or four times a day. Whatever may be determined upon respecting general depletion, there can be no doubt of the propriety and great advantage of leeches applied to the belly, followed by a poultice or a fomentation, according to the effect. The number may vary in general from five or six to ten, twelve, or more, and may be

repeated shortly afterwards, or as often as the local tenderness and pain shall appear to indicate; the fomentations or poultices being assiduously applied in the intervals. When the disease has been in a great measure subdued, but still some tenderness remains, the application of a blister or some stimulating and anodyne liniment will often be found of considerable service. If the case prove lingering, the aggravation of the pain and tenderness which from time to time takes place, will sufficiently declare the recommencement of inflammation, and, consequently, plainly indicate the propriety of repeating the local depletion and other measures as before, only perhaps with less freedom than at an earlier period; a precaution which applies in an especial manner to depletion, and to the administration of mercury. When, indeed, the strength is considerably impaired by the long continuance or frequent return of the disorder, it will often be prudent or necessary to abstain from mercury altogether.

Should the patient be costive, an occasional dose of senna and salts, or of castor oil, or a mild castor oil glyster, may be employed to move the bowels: if a troublesome diarrhoea supervene, it is to be controlled by chalk mixture, with or without a few drops of laudanum, or a little catechu, according to its urgency. If, on the other hand, sickness prevail, attempts must be made to allay it by the effervescent draught; by a few grains of magnesia, and two or three minims of vin. opii in simple water or peppermint water; by one or two minims of Scheele's hydrocyanic acid in any simple fluid, together with either a few grains of carb. magnesiæ, or sesquicarb. sodæ; or by the application of a mustard poultice to the pit of the stomach. The patient should be confined to bed, and supported by the blandest food, such as sago, arrow-root, light pudding, and milk if it agree; with barley-water for drink; the allow-

ancee, both as regards quantity and quality, being gradually increased as the disease subsides, or as faintness and weakness prevail. From mild farinaceous articles he may proceed to beef-tea and animal jellies, and from these to fowls or plainly dressed meat, till at length the ordinary diet may be resumed. The more lingering the case, and the more frequent the relapse of the disorder, the milder must be the medical treatment, and the more liberal the allowance of support.

After the recovery of the patient, we should endeavour, by all the means in our power, to prevent a return of the complaint: this will be best accomplished by strictly guarding against exposure to the predisposing and exciting causes, and by diminishing the susceptibility, and improving the general health of the individual. If practicable, he should enjoy the benefit of country air, and moderate but regular exercise; he should be well nourished with bland and wholesome food; he ought carefully to avoid exposure to night air, and to damp and cold in general; he may use occasionally a warm sea-water bath; but above all things, he should wear warm clothing, with a flannel shirt and woollen stockings. As an additional means of improving the general health, the state of the bowels ought, if necessary, to be regulated by gentle laxatives, such as magnesia, rhubarb and magnesia, or senna and salts; interposing occasionally a laxative of the mercurial kind, of which rhubarb and calomel form probably one of the best. We may sometimes also, with advantage, administer some mild tonic, such as the gentian, colombo, or cascarilla, in infusion, with a little aromatic tincture, and a few grains of the *sodæ sesquicarb.*; or, in other cases, a little infusion or decoction of *cinchona*; or small doses of the disulphate of quinine in *decoct. sarzæ*, or *infus. serpentariæ*, may be tried. Chalybeates are often of service, of which the ferri

iodidum, in quarter or half grain doses, two or three times a day, will be found one of the most efficient: it may be given in the *infus. anthemidis*; the combination being rendered more palatable by the addition of syrup and tincture of orange-peel.

LATENT CHRONIC PERITONITIS.

In examining bodies, chiefly of adults, after death, we often find that the peritoneum has partially, or perhaps almost universally, undergone a very remarkable change, appearing opaque, and as if more or less thickened; this opacity and apparent thickening being accompanied by a manifest contraction or shrinking of the membrane upon the parts or organs with which it is connected, or to which it affords a covering; the intestines, and often the stomach also, not only present more or less opacity, but are more substantial and massive to the feel, and of somewhat less calibre than natural: the mesentery is also thickened, and so shortened as to draw the intestines back towards the spine; whilst the peritoneum covering the liver and spleen is so opaque as almost to conceal the natural colour of the organs, at the same time that it has the effect of rounding their edges, and causing them to appear considerably shrunk in size: the omentum, too, is frequently found to have undergone a remarkable change, being shrivelled up into an elongated, dense mass, stretching across the abdomen immediately below the stomach. All these changes, whether partial or general, unquestionably result from previous inflammation, and the formation and subsequent organization and contraction of a false membrane upon the free surface of the peritoneum. Although adhesions are comparatively rare, it is possible that this state of things may have been the effect of a previous attack of acute peritonitis, which had been early checked either by nature or by art. It is very

seldom, however, that we can discover the least evidence of such having been the case. There is much better reason for the belief that the original inflammation, in most of such cases, is, from the beginning, of a purely chronic kind, commencing and making progress in a slow and insidious manner, without causing a sufficient degree of local or general disturbance to create alarm, or even to attract the attention of the patient. In some instances, however, the case is different, both the general and local symptoms being not only manifest, but more or less distressing and alarming to the patient. He probably complains of a general feeling of indisposition, some emaciation, and loss of appetite and strength; he passes restless nights, and has slight, irregular, febrile accessions; his countenance gets pale or sallow, his tongue foul, and his bowels costive; he experiences a sense of uneasiness, tightness, or oppression in the abdomen, and occasionally slight erratic pains; or he feels a certain degree of pain or tenderness on making rude and sudden pressure on the abdomen. These symptoms are frequently accompanied or presently followed by enlargement of the belly; a fluctuation can be felt, and a decided inflammatory ascitis is thus developed; an ascitis which generally differs from an ordinary ascitis depending upon obstructed viscera, in the more rigid, rounded, and prominent swelling of the belly; in the greater degree of tenderness on making rude pressure, and in the less extent of tympanitic sound on percussion, in consequence of the intestines being drawn towards the spine.

It has already been observed that this form of disease of the peritoneum may probably arise, in some rare instances, from acute inflammation early checked: the inflammation may be developed without our being able to ascertain the existence of any exciting cause whatever: or it may probably be induced by the more ordinary causes of inflammation so

often mentioned. In a large majority of cases, however, the disease seems to be intimately, if not essentially, connected either with mottling of the kidney, or with diseased liver: and hence it is, perhaps, that it is so frequently met with in persons of intemperate habits, or whose occupation subjects them to causes which are known greatly to influence the state of the kidneys. This morbid condition will be more particularly dwelt upon when treating of dropsy.

GASTRITIS, MUCO-GASTRITIS, GASTRITE.

By Gastritis is meant an inflammation affecting the mucous membrane of the stomach; an inflammation which not unfrequently extends to the subjacent tissues, and in some rare instances even to the serous or peritoneal covering of the organ. It may occur in an acute, subacute, or chronic form, and undoubtedly with a corresponding variety of symptoms; it is nevertheless not a little remarkable, that there are few diseases of common occurrence which are involved in greater obscurity, or which have given rise to greater discrepancy of opinion amongst medical men; the apparent causes of which it is desirable to point out to the student, in order that he may be able distinctly to comprehend what is at present known on the subject. In the first place, acute gastritis is rarely met with, in the adult at least, independently of the operation of some acrid or corrosive poison, and when so produced it is almost impossible to determine how far the symptoms depend upon mere inflammation of the stomach, and how far they result from the specific operation, local and general, of the poisonous substance; hence the differences observable in the history of acute gastritis, as given by different writers, according to the circumstances of the particular case from which they had derived their information. In the next place, those

who regard all fevers as consisting essentially in inflammation of the mucous membrane of the stomach and intestines, the gastro-entérite of the French school, have mixed up with the history of gastritis that ever-varying assemblage and train of symptoms, usually regarded as characteristic of a general disease, which we denominate idiopathic fever, and of which gastritis appears to form an accidental but not an essential part; and lastly, symptoms commonly regarded as characteristic of chronic gastritis, are repeatedly met with in cases in which neither the previous history, nor the effects of remedies, are reconcilable with its existence; so that the real nature of the disorder often remains, to the last, a mere matter of conjecture. A due consideration of all these circumstances will, it is hoped, sufficiently apprise the student of the difficulties which beset the subject of gastritis in all its forms, and prepare him to receive with caution and reserve even the best description that our experience has enabled us to give of the complaint.

ACUTE GASTRITIS.

This disease is characterized in an especial manner, by remarkable irritability of the stomach, and severe pain on making pressure over the region of that organ. The nausea or sickness is for the most part incessant, so that whatever is taken into the stomach is immediately rejected; there is a degree of fullness, with great tenderness and exquisite pain on pressure at the scrobiculus cordis, from whence stinging or shooting pains are occasionally observed to extend into the hypochondria, and to the back between the shoulders; the thirst is intense and unquenchable, and the patient is constantly craving for cold drinks, which, in many instances, are no sooner swallowed than they are vomited up again; with these symptoms we have more or less febrile excitement, the skin is hot, the pulse usually

small, soft, and frequent, and sometimes irregular or intermitting; the tongue probably white and furred, sometimes red at the tip and edges, but of no uniform or certain character; the respiration is more or less hurried; the patient experiences a remarkable sense of faintness or prostration; and his countenance is pale and expressive of distress; the bowels are costive, and the urine commonly scanty and high-coloured. Should these symptoms not be relieved, the patient rapidly emaciates, with increasing faintness and debility; the countenance gets remarkably pale and shrunk; and the eyes hollow; the eyelids are half-closed; the pulse small, thready, and creeping; the extremities become cold; drowsiness, delirium, or stupor supervenes; and the patient expires, probably after a period varying from two or three days to a fortnight. This may be regarded as a very general character of acute gastritis, when produced by ordinary causes of inflammation; of course, when it is the result of poisonous substance taken into the stomach, which is most frequently the case in the adult, not only will the symptoms enumerated be observed to vary in number and intensity according to the quantity of the poison taken, the state of the stomach at the time, and the period that has elapsed; but divers nervous and inflammatory affections will be found superadded, according to the nature of the hurtful agent; varieties and complications which it is the business of writers on medical jurisprudence minutely to detail.

Morbid Appearances.—The morbid appearances most frequently met with after death from ordinary gastritis, are, partial or universal redness of the mucous membrane of the stomach, from fine and arborescent injection of blood-vessels; minute ecchymoses into the submucous cellular tissue; thickening, and such softening of the mucous membrane, that it readily peels off; a thick coating of viscid mucus; prominence of the mucous follicles, and small roundish or

oval ulcerations in various parts. In some instances the entire parietes of the stomach have appeared to be morbidly thickened and more substantial than natural; whilst in others, they have been found so remarkably attenuated as to be lacerated by the slightest violence; but how far this latter condition was the effect of the inflammation, and how far it had resulted from the action of the gastric juice subsequent to death, it is difficult or impossible to decide; indeed it ought to be carefully borne in mind, that great redness from minute injection of vessels, together with remarkable softening of the mucous membrane, is often found in the bodies of persons who have died of very different disorders; and in whom no suspicion had ever been entertained of inflammation of the organ previous to the death of the individual; neither must it be forgotten on the other hand, that even when it has been previously inflamed, a mucous membrane often fails to present any very strongly marked indications of such a condition after death. Of course, when acute gastritis is produced by a poison, the post-mortem appearances, as well as the symptoms observed during life, are infinitely varied according to the nature of the poison, the quantity swallowed, the condition of the stomach at the time, and the period that elapsed between taking the poison and the fatal result: there may be a mere blush of redness of the mucous membrane, as occasionally observed in poisoning with hydrocyanic acid; there may be redness, submucous ecchymoses, and effusion of albuminous matter on the mucous surface, as in poisoning with arsenic; or there may be total destruction of a large portion of all the tunics of the stomach, as in cases of poisoning with concentrated sulphuric acid.

Causes.—Little is known respecting the *predisposing* causes, beyond the fact, that the idiopathic form of the disease is most frequently met with in infancy, and espe-

cially in those infants who are of an irritable and highly-susceptible habit of body. In infancy, the ordinary *exciting* cause is the process of dentition; but whether dentition immediately induces the disorder in consequence of a direct sympathy existing between the irritated gums and the mucous membrane of the stomach; or whether it does so indirectly by interfering with digestion, and so rendering the ingesta of an acrimonious quality; is by no means very satisfactorily established. It may undoubtedly be induced by excesses in eating or drinking; by a highly-irritating diet; by swallowing cold liquids when overheated; and by exposure to ordinary causes of inflammation, such as cold and damp; although such cases are extremely rare. It may also arise from external violence, but by far the most common exciting causes in the adult are certain corrosive, acrid, or narcotico-acrid poisons, either accidentally swallowed, or taken spontaneously with a view to commit suicide; or secretly and maliciously administered with a murderous intent; such as the concentrated acids or alkalis; the salts of copper; arsenious acid; and cantharides. It has not unfrequently been produced in children by drinking boiling water or other hot liquids; and in adults by the application of arsenical preparations externally to a broken surface: it may be excited by the mechanical irritation of indigestible substances taken into the stomach; it may result from a casual aggravation of organic disease of that organ; it now and then occurs in connexion with diseased kidneys; a certain degree, but much less violent form of it than has been described, constitutes one of the most familiar complications of the common continued fever of this country; it may arise as a complication in the progress of the exanthemata, gout, erysipelas, and of inflammatory and febrile disorders in general; but especially in the fevers and inflammatory complaints of tropical climates.

Diagnosis.—The diagnosis is of great importance, not only because the disease is most frequently induced by a poison, but in consequence of several of its most prominent symptoms being sympathetically excited in a considerable variety of diseases. Remembering the extreme rarity of idiopathic acute gastritis in the adult, in every case attended with sickness or pain in the stomach, the practitioner ought carefully to inquire into the possibility of a poisonous substance having been administered either accidentally or with a foul design; and institute a proper examination of the matters rejected from the stomach. He must be equally vigilant to satisfy himself that the patient is not labouring under a strangulated hernia, or other obstruction of the alimentary canal. By far the most difficult part of the diagnosis is to distinguish gastritis from acute inflammation attacking the peritoneum, and especially that portion of it which covers the liver and other parts situated in the neighbourhood of the stomach. In both, we have great tenderness and acute pain on pressure; and in both there is very commonly excessive irritability of stomach; in both the patient looks pale and distressed; and in both he experiences a remarkable sense of faintness and debility. Idiopathic gastritis, however, is extremely rare in adults, being most commonly met with in infants, in whom it will generally be found to have been preceded, or to be accompanied, by vomiting, by motions having a sour smell, and purging of greenish stools; peritonitis, on the other hand, is most commonly met with in adults, and is pretty uniformly attended with costiveness; in peritonitis the tenderness and pain on pressure are more exquisite than in gastritis, and will be found to extend to some distance beyond the boundary of the stomach; in gastritis the pulse is usually soft, and the tongue more or less injected, if not highly red; in peritonitis the pulse is harder

or more concentrated; and the tongue less vividly red in its substance, whitish, and slightly furred on its surface. Any error of diagnosis in such a case will be of comparatively little practical consequence, in as much as in both diseases we have active inflammation; and, as in both, a somewhat corresponding treatment will be required. Besides the sources of error pointed out, it must be borne in mind, that great sickness, with or without pain in the stomach, may be a mere symptom or secondary effect of hydrocephalus, arachnitis, or organic disease of the brain; of diseased womb, of gall-stone, or of a calculus or disease of the kidney. Symptoms of gastritis are not unfrequently met with towards autumn, when common cholera-morbus, and disorders of the abdominal viscera in general, are liable to prevail. In such cases the gastric symptoms may either form a mere part of the cholera-morbus, or they may exist alone, and without any accompanying relaxation of the bowels.

Prognosis.—When acute gastritis occurs as an original or idiopathic disease in the adult, the prognosis must be drawn from a due consideration of the patient's age and constitution, the severity of the attack, and the period of the complaint at which proper assistance has been procured. When the patient is of moderate age; when the constitution is good; when the powers of the system have not been materially impaired by intemperance, gout, or any other cause; when the symptoms are not very violent, and when advice is early sought, there will be every reason to hope for a favourable issue: but when the patient is old, or of cachectic habit of body; when he has long suffered from gout; when the symptoms are extremely urgent; and especially if early assistance has been neglected; the prognosis is perhaps at all times unfavourable. In any individual case the favourable signs are, subsidence of the accompany-

ing fever, with a corresponding diminution of the local pain and irritability of stomach; abatement of thirst; a more animated and less shrunk aspect of the countenance; slow and easy respiration; diminished frequency and greater regularity of the pulse; and a warm and universal moisture of the skin. The unfavourable symptoms are, a high degree of fever; intense pain and tenderness at the *scorbieulus cordis*; incessant sickness or vomiting; great hurry of respiration; a rapid, small, and feeble or irregular pulse; great pallor and distress of countenance; hollowness of the eyes; hicough; coldness of the extremities; cold, clammy sweats; drowsiness, with half-closed eyes; stupor, coma, or delirium; and total cessation of pain. Nearly the same observations will apply to the case of infants; but in such young subjects, when proper attention is paid to the condition of the gums, and judicious treatment early adopted, the prognosis may be said to be upon the whole more favourable than in the case of adults.

Of course, when the disease is in consequence of a poisonous substance taken into the stomach, the prognosis must be determined by the nature and quantity of the poison, by the circumstances under which it was taken, by the presence or absence of early vomiting, by the time that has elapsed since the poison was swallowed, and by the difficulty or facility of removing it, either by means of an emetic or the stomach-pump. After the evacuation of the poison, the prognosis must in a great measure be regulated by the rules already laid down in regard to *idiopathic gastritis*. When produced by boiling liquids, the disease is at all times attended with great danger, and is often altogether hopeless; since, to all the perils of gastritis, we have superadded a most serious obstruction to the breathing, arising from inflammation excited in the neighbourhood of the glottis. If acute gastritis prove to be one of the forms of

misplaced gout, it has been observed that if the gouty inflammation can be recalled to, or reproduced in the joints, the disease for the most part proves much more tractable, and consequently much less dangerous. Occurring in connexion with mottled kidneys, it always proves exceedingly alarming; it rapidly and greatly reduces the general strength, and not very unfrequently proves the immediate cause of death.

Treatment.—The treatment of acute gastritis in the adult, will chiefly consist in general, but more especially local depletion, laxative enemata, and total abstinence from food for a time. When the patient is young and of good constitution; when the febrile reaction is considerable; or even if the latter be but slight, provided the local symptoms prove severe, general blood-letting may be adopted in the first instance with advantage, to an extent sufficient to make a decided impression upon the system. In proportion, however, as the disease is advanced, and the patient old or enfeebled, general blood-letting must be employed with caution, or altogether abstained from. A safer and scarcely less powerful remedy in every case, is the application of leeches to the pit of the stomach: the number may vary from ten or twelve to fifteen or twenty, and may be repeated to the same or a smaller number, as often as the pain, tenderness, and irritability of stomach shall appear to indicate. After each application of leeches, a warm poultice or fomentation may be applied to encourage the bleeding of the leech bites, if the strength of the patient permit. The bowels should be relieved from time to time by laxative injections of castor oil, or senna and salts; but it is desirable to abstain as much as possible from medicines given by the mouth. As the disease subsides, however, the irritability of the organ may sometimes be moderated by a few grains of carbonate of magnesia, and three

or four drops of *vinum opii*, in any simple watery vehicle; or, at a later period, by the hydrocyanic acid, two or three minims of Scheele's strength being given, with a few grains of magnesia, in any appropriate liquid. In other cases, the common effervescing draught, with excess of alkali, and perhaps a few minims of *tinct. opii* may be given with advantage; the carbonic acid gas, however, not unfrequently proves too irritating in a highly susceptible state of the stomach. The patient ought either to abstain altogether from food for a day or two, or only take the mildest and blandest articles in very small quantities at a time, such as a table-spoonful or two of milk, either alone or with one-fourth of lime-water; good barley-water; thin arrow-root, made either with milk or water, and a little sugar. Such patients usually have a craving for cold drink, which may be safely and advantageously allowed them, provided great moderation is observed as to quantity. Of these, cold spring water, gum water, iced water, or even water ices, are perhaps amongst the most eligible, given in small quantities at once, and frequently repeated. It has been recommended to apply ice to the pit of the stomach; but upon the whole, after the period of leeching is past, blisters, mustard poultices, common poultices, poppy fomentations, or stimulating and anodyne liniments are perhaps preferable. In proportion as the disease subsides, food may be taken with greater freedom; whilst, as a medicine, the carbonate of magnesia in small doses, either alone or with *vin. opii* or hydrocyanic acid, will be found most generally and certainly serviceable in allaying the remaining irritability of the stomach. So long as such irritability continues, milk, with one-fourth of lime-water, will often prove one of the mildest and most useful articles of diet.

When the disease arises from an acrid poisonous substance taken into the stomach, of course the grand object in every

instance is to remove it, either by means of an emetic or the stomach-pump: exclusive reliance ought on no account to be placed upon the employment of reputed antidotes.

In infants, the treatment of acute gastritis is somewhat different, and is founded upon a knowledge of what appears to be the real source of the disorder in a large majority of such cases. It usually occurs whilst the infant is suffering from dentition: the digestive process is deranged; the ingesta undergo chemical changes, by which they are rendered highly irritating to the stomach, and in many instances to the whole of the alimentary canal, as shown by the sour smell of the matters vomited, and by the sour smell, green colour, and watery consistence of the stools. Hence, the practice which we have found most uniformly safe and successful, consists in relieving the irritated gum by a gum lancet, and correcting the acid condition of the *primæ viæ*. It may, indeed, be prudent to apply two or three leeches from time to time to the *scrobiculus cordis*, and immerse the patient in a warm bath; but almost certain relief will be procured by a cautious use, at the same time, of antacids and absorbents. If the mucous membrane of the bowels appears to be involved, as indicated by the diarrhoea, the chalk mixture, made with plain instead of aromatic water, in a dose of one, two, or three teaspoonsful, according to the age, frequently repeated, either alone or with a very minute quantity of laudanum, from one-fourth of a drop to a drop, will often answer exceedingly well. In other cases, whilst giving the chalk mixture by the mouth, a little thin starch, either alone or with from six or eight to fifteen or twenty minims of syrup of poppies, may be administered as a glyster. If, on the other hand, the bowels are confined, from two to six grains of magnesia may be substituted for the chalk; and if insufficient to move the bowels, half a scruple or a scruple of sulphate of magnesia may be added to each

dose. In cases where the bowels are only very moderately relaxed, a mixture of chalk and magnesia may be used with very excellent effect. The frequent application, for a short time, of a mustard poultice to the scrobiculus cordis will sometimes tend to allay the irritability of the stomach if it should prove stubborn. Of course, if the patient be an infant at the breast, a healthy nurse ought, if possible, to be immediately procured; a step equally necessary when the disease appears to be induced by attempts to wean, and the consequent use of improper or irritating food. Under such simple treatment and management, we often have had the satisfaction of observing the febrile excitement, the vomiting, and purging, speedily abate; whilst the diminished suffering of the child has been abundantly attested by its ceasing to cry, by its comparative quiet, and by its being able to enjoy natural and refreshing sleep. The treatment proper during convalescence will be that of chronic gastritis.

CHRONIC GASTRITIS.

Much has been said and written on the subject of chronic gastritis, and vast importance has been attached to it in modern times both as a cause and as a complication of a great variety of disorders; but in as much as the symptoms to which it is supposed to give rise are for the most part slight; as these symptoms often exist without evidence of actual inflammation existing; as its progress is in general remarkably slow, even when it is supposed to prove fatal; as it is only by an inspection of the body after death that we can arrive at positive certainty; and as even the post-mortem appearances are not at all times very satisfactory; it will not surprise any person of experience to be told that few diseases are involved in greater obscurity, or afford a

wider field for professional controversy. Although the result of experience, therefore, the student must receive what follows with circumspection, and regard it as amenable to the various sources of fallacy inseparable from the present state of the subject.

Ordinary cases of chronic gastritis are principally indicated by some modification of pain or uneasiness in the stomach, divers lesions of digestion, certain changes in the appearance of the tongue, sallowness of the complexion, and very commonly by more or less emaciation. The pain is usually of a dull character, increased by firm or abrupt pressure, by taking stimulating food, and occasionally by stumbling, or any other sudden and considerable movement of the body: it is sometimes constant, although aggravated at intervals; at other times it is intermittent: it now and then seems to pass through to between the shoulder-blades, or is felt in that situation only, or is observed to dart or shoot towards the back, or into the hypochondriac regions: it is often accompanied by a sense of heat, fulness, or oppression, especially after meals; the sense of fulness may pervade the whole region of the stomach, or it may be more circumscribed, and limited to the large curvature of the organ, when it is frequently attended with a beating or pulsation either of the heart or of the large vessels in the neighbourhood. In general the appetite is impaired; but in some instances it is but little affected, and, in more rare cases, morbidly increased. The patient often complains of nausea or globus, or even experiences occasional attacks of vomiting; the bowels are flatulent and irregular in their action, being either costive, relaxed, or costive at one time and relaxed at another—these varieties being determined, in some measure at least, by the presence or absence of enteritis or colitis, of the same chronic character. The alvine discharges, although occasionally quite natural in appearance,

for the most part present some deviation in colour, being pale, clay-coloured, greenish, or very dark, and of an offensive odour; the tongue is usually covered with a white or yellowish fur in the centre, and especially towards the base; whilst it is either of natural appearance, or morbidly red and injected at the sides and tip: in some cases, however, the tongue is almost morbidly clean, sometimes tender, or even manifests, in common with the whole internal mouth and throat, a disposition to become aphthous. The patient often complains of a sense of heat in the throat, or of a degree of irritation which produces a huskiness of the voice, or even cough; and on inspection, the parts about the fauces are found to be unnaturally red and relaxed: he usually complains also of thirst, and frequently of headache, giddiness, or dimness of sight; his urine is sometimes quite pale, sometimes cloudy, sometimes scanty and high-coloured, with or without a lateritious deposit on standing; he is languid or low-spirited; he loses flesh and strength; his countenance appears sallow, with a dark areola around the eyes, and a remarkable yellowness extending over the cheek-bones towards the temples; the pulse varies very much, being sometimes quite natural, but more commonly frequent, sharp, and perhaps intermitting: the sleep is in general disturbed or unrefreshing; and an irregular form of hectic now and then prevails, particularly in aggravated or in advanced cases. With a greater or less number of these symptoms the disease may proceed for months or years, and at length gradually subside, either through the natural efforts of the constitution, or as the result of appropriate remedies and management. In a considerable proportion of such cases, however, the patient at length sinks, either in consequence of the supervention of some disorder connected, apparently, directly or indirectly, with the original affection of the stomach, such as a stubborn diarrhœa, dysentery,

phthisis pulmonalis, bronchitis, erysipelas, latent pneumonia, or perhaps disease of the liver, and consequent dropsy; or in consequence of a casual attack of fever or other disease, perhaps altogether unconnected with the original affection, but which, from the impaired condition of the constitutional powers, speedily destroys life.

In some cases, but especially in those connected with habits of intemperance, after suffering an indefinite length of time from symptoms of chronic gastritis, a patient is suddenly seized with faintness, giddiness, and sickness, and presently vomits a large quantity of dark blood, either in a fluid state, or partly fluid and partly coagulated. The quantity of blood thus vomited varies much in different cases, being occasionally only a few ounces, at other times amounting to the enormous quantity of several pints. When the quantity is large, as is very commonly the case, the patient either speedily expires, or is left exceedingly pale, cold, and faint. In general, however, he sooner or later rallies, when it is found that the pain and tenderness of the *scrobiculus cordis*, previously complained of, has either ceased entirely, or is considerably diminished. Part of the blood thus poured into the stomach passes off by stool; and as it undergoes a change in its passage through the bowels, it is found to render the alvine discharges, for perhaps two or three days afterwards, almost as black as pitch; indeed it occasionally happens that very little or even no part of the blood is vomited, but continues to pass altogether through the bowels, when it may escape observation, unless care be taken to examine the patient's stools.

When the disease occurs in delicate, nervous, and hysterical females, which is by no means unusual, it is apt to assume a more decided and active character; and the symptoms, though the same in kind, prove much more distressing; the tenderness is greater, and the pain on pressure

more acute, and often darts or shoots towards the back, and into the hypochondriac regions: in short, it appears to be mixed up with a considerable degree of that neuralgic state so commonly met with in such subjects. The patient is harassed by a distressing sense of globus and flatulent distention, faintness, palpitation, nausea and sickness, and frequently vomits either the ingesta, or a viscid mucus; the latter being, in some aggravated or protracted cases, so blended with blood as to present the appearance of semi-fluid red currant-jelly; or perhaps the patient vomits a small quantity of blood, nearly pure and unmixed. Although of this more active character, such a case may continue for weeks or even months with little variation, or it may subside, and again return for an indefinite number of times; and in either case with comparatively little danger to life.

Morbid appearances.—The morbid appearances will necessarily vary according to the activity, duration, and cause of the disease. The slightest morbid change observable is flatulent distention of the stomach, with excessive vascularity of the mucous membrane, either in an arborescent form, or causing a more or less uniform redness of some part of the internal surface of the organ, these appearances being in general most considerable at the large curvature. With this increase of vascularity, we sometimes find the whole membrane softened, and thickly coated with tenacious mucus. In a hysterical female, with great redness of the mucous membrane lining the large curvature of the stomach, we have found the whole surface covered with a bloody mucus exactly resembling that which is occasionally vomited by such patients. The mucous membrane is occasionally observed to be remarkably firm, sometimes apparently thinner, sometimes apparently thicker than natural, but firmly adherent to the subjacent tissue, and with the follicles probably somewhat prominent, in cases where there

has been good reason for believing that such appearances were the result of a previous chronic gastritis. In other instances the whole parietes of the stomach are morbidly thickened, and the organ itself contracted in size; in others we discover small, superficial, roundish or oval ulcers interspersed through the general redness, or, more rarely, one large ulcer, with greatly thickened edges. In the latter case, the ulcer is, perhaps, most frequently met with on the dorsal aspect of the small curvature; it sometimes penetrates to the peritoneum, when that membrane usually inflames and forms an adhesion to the pancreas, or other parts adjacent; or, failing an adhesion, the peritoneum has given way, and the contents of the stomach being effused into the peritoneal cavity, have quickly excited a fatal peritonitis. Sometimes the stomach appears to be unnaturally large, attenuated, and flabby; sometimes attenuated and exceedingly lacerable; or perhaps the mucous membrane is found remarkably softened, so as readily to separate from the submucous cellular tissue; but how far the last-named changes are attributable to a previous gastritis, and how far they may be owing to the solvent operation of the gastric juice after death, it is difficult or impossible to determine. It has also been supposed that chronic gastritis may give rise to that remarkable change and hypertrophy of the submucous cellular tissue of the stomach, which constitutes one of the forms of what has been called cancer of the organ, and scirrhus pylorus; it is probable, however, that chronic gastritis is more frequently an effect than a cause of these morbid conditions.

When the patient is suddenly cut off by hæmatemesis, or vomiting of blood, the mucous membrane of the stomach is generally found remarkably red, and somewhat ecchymosed, but without the least abrasion. In some rare cases, nevertheless, an ulcer has been found under such circumstances;

from which, in part at least, the hæmorrhage may have proceeded.

In addition to the various morbid appearances mentioned, it is very common to find disease of the liver, and marks of inflammation, or even of ulceration of the small, and sometimes of the large intestines.

Causes.—Chronic gastritis is met with in both sexes and at every period of life, but perhaps most frequently in males of from thirty to fifty years of age, and in persons of a scrofulous, plethoric, and highly irritable habit of body, especially when such persons lead a sedentary and studious life, or are subjected to strong passion, or to much care and anxiety. With regard to the *exciting causes*, it may be a mere sequel of acute gastritis, as is very commonly seen in the adult after poisoning, and in the infant during dentition; it may proceed from a blow on the stomach or other mechanical injury; from the mechanical irritation of some indigestible substance accidentally or wilfully swallowed; from habitually pressing the stomach against a table as in writing, or even from powerfully bending the body forward, as in washing or shoe-making; it may be excited by an over-dose, or the long-continued use of stimulating or acrid medicines, such as arsenic, iodine, the salts of copper, or colchicum; by the external application of arsenical preparations to a broken surface; or, as there is reason to believe, by snuff taken as a luxury: it may be induced by drinking cold liquids when the body is overheated, or by partial or general exposure to damp and cold; it may succeed to small-pox, measles, scarlet fever, erysipelas, or gout; but by far the most prevalent exciting cause is indisputably excess in eating and drinking, and more especially the use or abuse of highly-seasoned or otherwise stimulant food, and ardent spirits. It would appear, nevertheless, not unfrequently to be the result of unwholesome,

unnutritious, or indigestible food, or even protracted want and starvation. In young hysterical females it appears most frequently to originate in the high degree of irritation of the stomach so commonly attendant upon a disordered condition of the uterine system. It may also arise from suppression of the menses, or of an hæmorrhoidal discharge, or from the healing of an old ulcer. It is a very common attendant on organic disease of the viscera, and on several forms of chronic cutaneous disease; in both of which, in conjunction with enteritis, it now and then proves the immediate cause of death.

Diagnosis.—For the reasons already given, it is at all times difficult and often quite impossible to arrive at positive certainty as to the existence or nonexistence of chronic gastritis: it is, however, satisfactory to know that the treatment applicable to chronic gastritis is not in general very inapplicable to those diseases with which it is liable to be confounded; for, in the majority of such doubtful cases, chronic gastritis either exists as a mere complication of some other disease, or the symptoms which lead to the suspicion depend upon an irritated condition of the stomach, which, if it do not amount to actual inflammation, is very closely allied to it. These doubtful cases are chiefly to be found in certain forms of dyspepsia, or merely functional disorder of the stomach, chronic inflammation of the liver, and in organic or malignant disease of the stomach itself, or of the neighbouring viscera.

Simple dyspepsia is most frequently met with in youth and during the middle period of life; chronic gastritis from middle age to advanced life; chronic gastritis often follows in the train of some previous disease, such as fever, small-pox, measles, and scarlet fever; or results from manifest intemperance; dyspepsia more commonly arises without any very obvious cause, and persists in spite of

every care and precaution; dyspepsia is less frequently attended with pain; or if it be present, it is more decidedly of an intermittent and neuralgic character, and is often quickly relieved rather than aggravated by stimulants; in simple dyspepsia, too, there is seldom much emaciation; and whether present or not, we seldom observe the sallow complexion, the dry and shrunk condition of the general surface, the relaxation and irritation about the fauces, the white, and at the same time injected tongue, the sharp pulse, and the irregular development of hectic, so common in chronic gastritis. Notwithstanding these general differences, cases will often occur in which it will be impossible to arrive at a positive conclusion; but, as already stated, it is of comparatively little consequence in a practical point of view.

As chronic inflammation of the liver, like chronic gastritis itself, is very commonly the result of intemperance, it cannot be a matter of surprise that they should often exist together; neither is it improbable that gastritis so induced may prove the immediate cause of hepatitis, or the reverse. At all events, we know that chronic hepatitis seldom exists without manifest symptoms of indigestion, and other indications of gastric derangement very common in chronic gastritis. But whether chronic hepatitis exist alone or in conjunction with gastritis, its presence will be indicated by a more decided fulness, uneasiness, or dull pain at the scrobiculus cordis, extending into the right hypochondrium, or occasionally to the right shoulder-blade, and increased by strong pressure made beneath the margins of the ribs, and towards the right of the scrobiculus cordis. When with these symptoms we find an icteritious aspect of the eyes or countenance, a yellowish fur upon the tongue, a bitter taste in the mouth, pale and clay-coloured stools, and scanty and high-coloured urine, depositing a lateritious sediment on standing, there can be little doubt concerning

the existence of chronic inflammation, or at least of a highly congested state of the liver.

Organic or malignant disease of the stomach, or of the neighbouring viscera, must be detected by an attentive consideration of the history of the case; by the presence of unusual symptoms, and by the change of complexion, and the wasted and withered aspect of the patient. When the pylorus, pancreas, or liver is involved, a hardness or enlargement may sometimes be felt in their respective regions. In scirrhus pylorus the countenance is usually remarkably pale; in diseased pancreas it is often of a very pale or greenish lemon colour, or the patient is deeply jaundiced, and probably passes by stool a quantity of oily or fatty-looking matter; whereas, in organic disease of the liver, instead of actual jaundice, which is comparatively rare, we most commonly have the complexion of a brighter lemon hue than in disease of the pancreas; differences which will be more particularly dwelt upon when treating of these respective disorders.

When chronic gastritis is complicated with enteritis, the complication is occasionally announced by the vividly red and partially coated, or by the morbidly clean tongue; by a tympanitic state of the bowels, and by vague pains in some parts of the abdomen. When the duodenum is involved, the sickness is apt to become unusually urgent, whilst the countenance is more or less icteritious: when the ilium is the principal seat of the disease, it is chiefly indicated by the vividly red or morbidly clean tongue; whereas, when colitis is present, the patient is almost uniformly affected with tormina, or griping and diarrhoea, or symptoms of dysentery; or these symptoms are readily produced by the mildest purgative medicine.

Prognosis.—When chronic gastritis is uncomplicated with any other disorder, when proper assistance is early

sought, and when the individual will strictly adhere to the rules and regulations laid down for his observance, the prognosis is at all times favourable. When, on the contrary, gastritis is complicated with another disease; when the patient persists in subjecting himself to the operation of the exciting cause or causes; when he will not observe a proper diet and regimen, the disorder may undoubtedly proceed to a fatal termination, either from gradual prostration and exhaustion, or, more commonly, by inducing a new, or aggravating an old disease, or by unfitting the body to combat the ordinary maladies and casualties to which the whole of mankind are liable. Of course, when complicated with chronic hepatitis, enteritis, or colitis, the case is much less promising than when it occurs in its simple form; although even here, under the favourable circumstances mentioned above, our efforts will often be crowned with success. When it accompanies malignant or other organic disease, either of the stomach itself or of the neighbouring viscera, although it may admit of mitigation from proper treatment, it will for the most part continue more or less urgent to the termination of these pretty uniformly fatal affections.

The favourable symptoms, during the progress of any individual case of simple chronic gastritis, are, diminution of the pain, tenderness, sense of fulness, or other uneasiness in the region of the stomach, especially after meals; cessation of nausea or sickness; an improved appetite, the tongue becoming cleaner or more natural, and the pulse softer, slower, and more regular; a gradual subsidence of the dyspeptic symptoms, with a corresponding return of flesh and strength, and of the original clearness and transparency of the complexion. When a copious hæmatemesis takes place, although it is sometimes quickly fatal, and at all times exceedingly alarming, the patient for the most part

rallies, and ultimately recovers, unless, indeed, the liver happen to be severely involved, when the hæmatemesis may be speedily followed by ascitis or general dropsy, ending in death. When the disease occurs and assumes a somewhat active form in delicate, irritable, and hysterical females, it often proves obstinate and unmanageable, but very seldom proves either directly or indirectly fatal, provided the morbid condition of the uterine system be properly attended to and corrected.

Treatment.—The treatment of chronic gastritis will principally consist in the repeated application of leeches or counter-irritants to the region of the stomach, and strict regulation of the diet and regimen; the patient at the same time carefully avoiding the exciting causes. According to the age and strength of constitution of the individual, from three or four to six or eight leeches may be applied to the scrobiculus cordis, and repeated as often as the pain and tenderness shall appear to indicate. Besides leeching, considerable benefit will sometimes be derived from the occasional application of a blister, or of the tartar emetic ointment, or a mustard poultice. In other cases, the liniment of ammonia and laudanum, in the proportion of a drachm or two of the latter to an ounce of the former, or a belladonna plaster may be substituted. The bowels should be regulated if necessary by some gentle laxative, either given by the mouth, or, what is perhaps better, in the form of glyster. The internal laxative ought at all times to be such as is least likely to irritate the mucous membrane of the stomach: of these, a mixture of carbonate and sulphate of magnesia, the former and rhubarb, castor oil, the compound rhubarb pill, and senna and salts, are amongst the most eligible; but although probably more irritating, a mild mercurial laxative given occasionally, is often followed by a very excellent effect: of this kind are four or

five grains of blue-pill or of hyd. c̄ crctâ, followed in a few hours by a little castor oil or warm senna and salts ; or even rhubarb and calomel in a moderate dose. The form of laxative, nevertheless, must be determined in some measure by the effect produced, as that which answers best in one case may be attended with inconvenience in another. It is also an important object to allay irritation in the stomach by the exhibition of some gentle antacid, mucilaginous, and soothing medicine ;—six or eight grains of carbonate of magnesia in simple water, or eight or ten grains of sesqui-carbonate of soda or bi-carbonate of potash, in thin gum-water or in infusion of hops, two or three times a day, will in general answer best, and may be rendered more grateful to the palate by the addition either of a little agreeable syrup, or of some of the aromatic distilled waters. At a later period our medicines may be more highly charged with aromatics ; or even some of the milder tonics may be substituted as vehicles for the magnesia or alkalies, such as the infusion of orange-peel, columbo, gentian, or quassia. Idiosyncrasy in regard to food and drink is so various in different individuals, that no universal rules can, perhaps, with propriety be inculcated ; nevertheless, from the very first the diet and regimen of the patient must be strictly attended to. He should abstain from all highly-seasoned or otherwise stimulating food, and from all rich or greasy compounds ; the diet consisting chiefly of farinaceous articles, milk, if it agree, and a small portion only of plainly-dressed meat once a day. Of drinks, perhaps one of the best is well-made barley-water, either plain or slightly flavoured with fresh lemon-peel, and sufficiently sweetened with white sugar ; or, in other cases, toast water, whey, or sugar and water, not too sweet. All spirits must be avoided ; and if the state of the patient's strength require a more nutritious

beverage, a little weak wine and water, or, if it agree, a small quantity of malt liquor, either alone or with an equal part of soda-water, may be allowed once or twice a day. The food ought at all times to be well masticated, and the meals slowly taken.

With such a plan of diet the patient ought to be warmly clothed, exceedingly regular in his exercise and rest, and enjoy, if possible, the benefit of country air, change of scene, and cheerful company. During the progress of treatment, an occasional warm-bath will be of service; and on convalescing, the shower-bath, or even the plunge-bath, may be employed to diminish morbid susceptibility, and restore the general strength.

When the situation and character of the local pain, the icteritious eye and complexion, and other symptoms, indicate a complication of chronic hepatitis, which is exceedingly common, it will not unfrequently be necessary to have recourse to cupping at the scrobiculus cordis and right hypochondrium, as being more powerful than leeching or blistering. It is in such cases that, in general, speedy and sometimes complete relief is obtained by giving a single grain of blue pill, with three or four of the extract of conium or extract of hyoscyamus, twice or at most thrice a day, exhibiting at the same time six or eight grains of carbonate of magnesia, with half a drachm or a drachm of the sulphate in simple or aromatic water, two or three times a day, in order to maintain a moderate action of the bowels. Should the mercury be observed to affect the mouth, it must either be given less frequently or altogether suspended. It is in such cases, too, that copious hæmatemesis most frequently occurs; and accordingly, as soon as the hæmorrhage has been checked by cold drinks, acetate of lead, oil of turpentine, or other appropriate remedies, or

has spontaneously ceased, which it generally does, a corresponding practice will be found, perhaps, more successful than any other.

When chronic gastritis attacks hysterical females, besides the general and local remedies already mentioned, we must endeavour to remove the morbid irritability of the uterine system, and secure a natural and easy flow of the catamenia.

ENTERITIS, MUCO-ENTERITIS, ENTÉRITE.

By the term Enteritis we mean an inflammation affecting the mucous membrane of the small intestines; an inflammation which occasionally extends to the other tunics of these organs, and is not unfrequently associated with a corresponding condition of the mucous membrane of the cæcum and colon, or of the stomach, or of both of these at the same time. It may occur in an acute or in a chronic form. Before proceeding, however, to the consideration of Enteritis, we think it right to observe, that in this disease, as in gastritis, great perplexity and confusion have been occasioned to the student by the attempts of some modern pathologists to identify enteritis with the various forms of idiopathic fever. That both enteritis and gastritis are very frequently, or perhaps pretty uniformly present, in a greater or less degree, in idiopathic fever, is not to be denied; neither can it be disputed that they greatly modify its character, and very materially influence the result: nevertheless, such frequent complication and such influence by no means warrant the conclusion that gastro-enteritis and idiopathic fever are identical. In the present state of our knowledge, therefore, we cannot help thinking that it is more in accordance with general experience, more practical and safe, and unquestionably less ambiguous, and more intelligible to

the student, to regard enteritis as a disease which may occur altogether independently of idiopathic fever strictly so called, and as one which, when it does occur in idiopathic fever, merely imparts to the latter a peculiar character, as any other important complication might be expected to do.

ACUTE ENTERITIS.

Acute enteritis may be said to be characterised, in general, by griping, flatulency, diarrhœa, and more or less pain on making abrupt or firm pressure upon the abdomen: the symptoms, nevertheless, vary in number, kind, and degree, in different instances, according to the constitution or idiosyncrasy of the individual, the extent and severity of the inflammation, and the particular portion of intestine which happens to be chiefly affected.

In its mildest form, the patient usually, at first, experiences a deep-seated, dull, and griping pain in some part of the abdomen, but most frequently about the right iliac region, which presently extends towards the umbilicus, and occasionally over the whole of the abdomen, and is attended with flatulency, distention, and constipation. In a short time, however, and in some instances from the very commencement, a purging supervenes, of an unnatural mucous or serous-looking, variously-coloured, and offensive matter, more or less copious according to the severity, the seat, and extent of the inflammation. These symptoms are sooner or later succeeded by partial or general tenderness of the abdomen, although moderate and cautious pressure may often be made without much increase of suffering: the griping pain, however, is much aggravated at intervals, apparently in consequence of the irritation occasioned by the movement of flatus in the inflamed portion of the bowel. Such mild cases are rarely preceded by chilliness or shivering, and the accompanying febrile disturbance is for the

most part exceedingly slight; the skin is rather warm than hot, sometimes moist, at other times dry; or perhaps these two conditions alternate with each other; the pulse is accelerated, but soft and compressible; the patient complains of thirst, occasionally with slight nausea; the appetite is sometimes lost, at other times but little impaired; the tongue is moist, its tip and edges red, and its centre covered with a whitish fur; the face is pale, but occasionally flushed at intervals on one or both cheeks; there is probably some degree of drowsiness; the respiration is but slightly hurried; and the urine is scanty and high-coloured. These symptoms may proceed with little variation for a few days, and then gradually subside and disappear.

When the inflammation assumes a more aggravated form, and is of greater extent, the disorder is usually preceded by general indisposition, alternations of heat and cold, pains in the limbs, and a feeling of faintness. The pain in the bowels is much more acute; it is attended with severe griping, occasionally with a sense of heat in the parts, and is greatly increased by even moderate pressure, whilst the whole belly feels more full and turgid, or, as it were, more doughy than natural; in a short time, however, the abdomen becomes more or less tympanitic, with an aggravation of the tenderness and griping pains. With these symptoms, although constipation now and then prevails, the patient is commonly affected with a frequent purging of a mucous, serous, or bilious-looking, fetid matter, not unfrequently mixed with blood; the efforts at stool aggravating the pain in consequence of the contraction of the abdominal muscles compressing the inflamed bowels; the skin is hot, and usually dry; the pulse, when diarrhoea prevails, is generally small, frequent, and very compressible; occasionally, however, and especially if there be constipation, it is firm and full, but still without the hardness

observed in inflammation of the serous membrane; the tongue is red at the tip and edges, and white and furred at the centre and base; at other times it appears of a deep red throughout its whole substance, being at the same time morbidly clean or polished, or probably with a manifest prominence of the papillæ; the thirst is urgent, occasionally with nausea, or even vomiting; the appetite is entirely lost, and the urine scanty and high-coloured; the respiration is short, hurried, and costal; the face is remarkably pale, with a shrunk or distressed expression of countenance, and often with a sallow or yellowish tinge about the nose and upper lip. In other cases there is occasional flushing of one or both cheeks, together with a considerable degree of drowsiness; and in every instance the patient experiences a remarkable sense of faintness and debility.

When such a case terminates favourably, the symptoms, after a few days, begin gradually to subside; the tenderness, griping, and diarrhœa, become less urgent; the thirst abates; the skin gets moist and less hot; the pulse slower and fuller; and the countenance less shrunk and more animated; the distressing sense of faintness and prostration is no longer complained of; the urine deposits a sediment; the appetite returns; and the patient, for the most part, passes into a state of comparatively rapid convalescence. When, on the contrary, such cases prove fatal, the pain, griping and purging continue incessant, and are, perhaps, accompanied by distressing sickness or vomiting; the face gets pale and shrunk, and the cheeks hollow; the eyelids appear to be half-closed, exposing a part of the whites of the eyes; the patient rapidly emaciates; the extremities become cold; stupor or coma supervenes; the pain is no longer complained of; the urine and stools pass off involuntarily; the pulse gets rapid, or less frequently slow, creeping, and thready; cold, clammy sweats

break forth ; and at length the patient expire , completely exhausted.

By far the most terrible and dangerous, but, fortunately, also the most rare form of acute enteritis, is that in which all the tunics of the intestine, including the peritoneum, appear to be involved in the inflammation. In this case, the deep, grinding, and sickening pain is sometimes quite excruciating, and is so much aggravated by the slightest pressure, that the patient is almost incessantly changing his position in order to obtain relief from his perhaps remitting but never-ceasing sufferings—lying on his back, with the legs and thighs flexed—resting on his knees and elbows—throwing himself flat on his belly—or sitting up in bed, with his body bent forward against the flexed thighs. In other instances, the abdominal parietes feel hard, and are spasmodically drawn towards the spine ; there is either obstinate constipation, or a frequent, scanty, dejection of unhealthy, frothy, and bloody stools, which are passed with extreme pain, and are attended with almost insupportable gripings. In some cases the belly becomes rapidly tympanitic, whilst the patient is harassed with repeated vomiting or hiccough, or both ; the countenance is pale, and strongly indicative of depression and distress ; there is often but little heat of skin, and the pulse is frequent, small, and usually hard. Such cases most commonly, but not uniformly, result from some mechanical cause ; the powers of life are in general rapidly exhausted ; and the disease accordingly, for the most part, proves speedily fatal.

Although the symptoms usually attendant on the ordinary forms of acute enteritis are such as we have enumerated, the student must carefully bear in mind that they are by no means constantly present, even in the most acute cases ; and that both their number and kind depend very much upon

the seat of the inflammation. When the duodenum is chiefly affected, the disorder has commonly been observed to be attended with great irritability of stomach, nausea and vomiting; but how far such a state of the stomach results from mere sympathy with the inflamed gut, and how far it depends upon the disorder being complicated with actual gastritis, is a question not very easily solved. With this great irritability of stomach we also generally find in duodenitis a remarkably sallow or ieteritious aspect of the countenance, or sometimes even a deeply jaundiced state of the whole surface; and if a purging be present, which may or may not be the case, we have observed the stools to present a pale yellow and granular appearance, somewhat resembling pea-soup. In a case which dissection proved to have been one of exclusive duodenitis, the prostration resembled that of Asiatic cholera, and the blood drawn scarcely coagulated; but there was no purging. When, on the other hand, the lower portion of the ilium is the chief seat of the disease, the principal indications of its presence are, a vividly injected and partially furred, or a morbidly clean and polished or raw-looking tongue, with a manifest disposition to an elongation or prominence of the papillæ; a remarkable tendency to drowsiness, and occasionally flushing of one or both cheeks. When to these symptoms a purging is superadded, which is not always the case, there can exist little doubt that the ilium is principally involved; whereas, when the jejunum and upper portion of the ilium are chiefly affected, the indications are rather negative than positive; for we fail to observe the preponderance of those symptoms which usually characterize inflammation of the duodenum, or lower part of the ilium.

When acute enteritis occurs in infants, it may present the ordinary symptoms pointed out as characterizing the disorder in the adult; but when unattended by a purging,

it is chiefly recognized by the hot skin, especially over the region of the belly; the great restlessness and fretfulness, and almost constant crying of the child; the frequent drawing up of the legs; the pale and shrunk or distressed aspect of the countenance; the sallow tinge about the mouth and nose; the thirst manifested by the avidity with which it seizes the breast; by the heat of the mouth; by the drowsiness or tendency to stupor; by the quick pulse, and by the appearance of the tongue, which is pretty uniformly red throughout its entire substance, sometimes partially covered with a whitish or brownish fur, sometimes morbidly clean, and in general manifesting a strong tendency to become dry and contracted.

Morbid Appearances.—In investigating the morbid appearances in any case of supposed enteritis, it must never be forgotten that, as in inflammation of mucous membranes in general, they are extremely fallacious; various degrees of redness having frequently been found after death, when there had existed no evidence whatever of inflammation during life; and, on the other hand, very slight or scarcely any morbid change whatever having been discovered, when no doubt could be entertained of previous inflammation. Generally speaking, however, the morbid appearances produced by acute enteritis are pretty obvious; the mucous membrane, over a larger or smaller space, and now and then in portions more or less remote from each other, is highly reddened: this redness is of two kinds—the one manifestly depends upon an extremely fine arborescent injection of the blood-vessels, as may be distinctly perceived by holding a portion of the slit intestine between the eye and the light; it is usually most intense or vivid on the edges of the valvulae conniventes, and is now and then accompanied by small superficial ulcerations of the membrane, resembling abrasions: the other presents an almost

uniform tinge, which appears to involve the entire surface and substance of the mucous membrane, as if it had been steeped or soaked in blood: these two kinds of redness, with or without slight abrasions, commonly exist at the same time, but in very different proportions in different cases. With such redness, the mucous membrane appears thicker, and at the same time softer, than natural; it is not unfrequently covered with a layer of mucus possessing a variable degree of visciditv, or, in the most severe cases, with minute grains or considerable patches of albuminous matter—the albuminous deposit being often very distinct on the edges of the *valvulæ conniventes*. The inflammation would appear, in some instances, to have involved the submucous tissue, as indicated by the thickened and more substantial condition of the entire intestinal parietes. Nevertheless, in certain leucophlegmatic and dropsical subjects, even after strongly-marked symptoms of acute enteritis, we have discovered very little redness, thickening or softening of the mucous membrane; instead of which, the parietes have appeared thin and flabby, the mucous membrane remarkably pale, and its secretion thin and watery.

It is not very uncommon to observe the small glandular bodies enlarged and prominent in the midst of the redness. This enlargement, when present, is very obvious in the duodenum, but is most frequently met with in the ilium, affecting both the solitary and aggregate glands. It is in the situation of these glands that we so often meet with that form of ulceration, and its consequences, which have already been described as frequently occurring in common continued fever—the disease, indeed, to which it is in a great measure, but not exclusively, confined. Ecthymosis is by no means very common, even in a slight degree, unless the extremely minute black points occasionally found

scattered over the mucous membrane in cases of suspected enteritis, and supposed by some to be an effusion of blood into the orifices of the mucous glands, are to be regarded as such. In some rare instances, however, we have found all the coats of a portion of a small intestine greatly thickened, somewhat softened, of a remarkably dark red colour, approaching to black, and copiously infiltrated with blood; whilst the mucous membrane itself was covered with mucus, intimately blended with blood of the same dark red or almost black colour. It is not very uncommon to find enteritis combined with peritonitis; but cases are very rare, in which, from thickening and softening of all the tunics, the peritonitis can be fairly supposed to have extended gradually from the mucous membrane to the peritoneum. In such cases the diseases appear to be co-existent, rather than the one a mere extension of the other. Of course many of the morbid appearances described may be associated with a corresponding condition of the stomach, especially when the duodenum is chiefly affected; or, what is infinitely more common, they may be found associated with a similar condition of the cæcum and colon when the lower portion of the ilium is the principal seat of the disease. The mesenteric glands are often found enlarged, reddened, and occasionally containing pus, especially in protracted cases, and particularly in that form of the disease which so commonly attends idiopathic fever.

Causes.—The disease, in its idiopathic form, may occur at any season of the year, but is, perhaps, most frequent in autumn. We meet with it at every period of life, but more commonly in infancy and youth than in either middle or advanced life. Persons of a delicate, irritable, and serofulous habit appear to be most prone to it, and especially those who manifest a strong tendency to derangement of the abdominal viscera generally. On the other hand, ex-

cept in common continued fever, the secondary or symptomatic form of it is perhaps most frequently met with in the aged, and in those persons whose general constitution has been previously brought into a cachectic condition, and especially when that condition has been induced by intemperance. With regard to the *exciting* causes, the most common are, partial or general exposure to damp and cold, but particularly when applied to the feet and legs; drinking cold liquids when the body is overheated; excesses in eating and drinking; the use or abuse of stimulating, indigestible, or unwholesome articles of diet, such as high-seasoned dishes, unripe fruit, shell-fish, acid wines, or malt liquors; acrid substances given as medicines, such as the more drastic purgatives, and colchicum; various aerid and corrosive poisons, such as the preparations of arsenic and copper; substances which act mechanically, such as the stones of fruit, worms, or accumulations of magnesia, sulphur, or chalk. It may supervene upon chronic ulceration of the mucous membrane; or it may be produced by a blow or other violence; by an intus-susception or strangulation of a bowel; and by the obstruction occasioned by bands of false membrane, resulting from former inflammation of the peritoneum. It may arise from suppression of the menstrual secretion, especially when suddenly occasioned by cold, or from suppression of a hæmorrhoidal discharge, or the healing up of an old ulcer. It is a familiar complication in the common continued fever of this country, and in the intermittent, remittent, and continued fevers of tropical climates. It may supervene in the progress of almost any inflammatory or febrile disorder, as in pneumonia, bronchitis, erysipelas, and the exanthemata generally. It occurs also, now and then, in connexion with severe burns or scalds, renal dropsy, and some of the chronic diseases of the skin.

Diagnosis.—Acute Enteritis may be confounded with common continued fever, peritonitis, colitis or dysentery, common cholera morbus, hernia, the effects of an acrid or corrosive poison, and in infants with hydrocephalus. To those who regard continued fever as the result of gastro-enteritis, any attempt at diagnosis may probably appear to be superfluous, unless, indeed, it were to distinguish inflammation of the villi of the intestines, from inflammation of the solitary and aggregate glands; a difference according to some pathologists upon which depends the particular form of what we have hitherto been accustomed to regard as idiopathic continued fever. Our experience, we confess, does not at present enable us to subscribe to this doctrine; on the contrary, however closely idiopathic fever and acute gastritis may occasionally resemble each other, and notwithstanding the extreme frequency of enteritis in what we understand by idiopathic fever, we nevertheless feel ourselves compelled to regard the two affections as distinct, and to believe that they may, and frequently do, occur altogether independently of each other. As a mild attack of acute enteritis may, like any other phlegmasia, be accompanied by a moderate degree of febrile excitement, and as its cause is out of sight, it may undoubtedly be mistaken for a slight attack of common fever; and when on the other hand acute enteritis proves severe, it may, like some other severe phlegmasiæ, give rise to a high degree of secondary febrile disturbance either of the inflammatory or typhoid type, according to the state of the patient's constitution, and thereby lead to a belief that the case is in reality one of severe continued fever: such equivocal cases, however, are rather the exception than the general rule. The strongly marked general indisposition, the appearance of the tongue, the headache and giddiness, the infirmity and unsteadiness of mind, the more decided aching of the back

and limbs, the stupid expression of countenance, and the spotted or maculated surface so commonly met with in continued fevers, are rarely observed at any period of acute enteritis; and at a still later period of the most severe forms of the latter, although there may be now and then considerable drowsiness or stupor, and occasionally delirium, together with much typhoid prostration, as indicated by the supine position of the patient, the rapid and feeble pulse, the injected dry and even brown or black tongue, we very seldom indeed have the strongly marked delirium, low muttering, or subsultus tendinum, the tremulous tongue and petechiæ observed in genuine continued fever; in short, although acute enteritis may, like some other acute phlegmasiæ, assume in certain constitutions a good deal of the appearance of mild inflammatory fever, or severe typhus, such cases cannot on that account, in the present state of our knowledge, be regarded as identifying continued fever with acute enteritis; any more than similar modifications of inflammation of the brain or lungs can be supposed to identify fever with cerebritis or pneumonia. It is also to be observed, that continued fever in all its forms pursues a somewhat regular course, both as regards the order and succession of symptoms; a circumstance much less perceptible in acute enteritis, and one which, to a person of moderate experience, will often present a sufficiently distinguishing mark between them.

Enteritis is to be distinguished from *Peritonitis* chiefly by the nature of the pain, the character of the pulse, the appearance of the tongue, and the state of the bowels. In peritonitis the pain is of an acute, burning kind, and is in general exquisitely aggravated by pressure; in enteritis the pain is of an intermittent and griping character, and is either comparatively little or sometimes not at all increased by pressure, provided it be cautiously applied; in perito-

nitis the pulse is commonly hard, in enteritis it is more frequently soft; in peritonitis the tongue is perhaps white and furred, but not particularly red; in enteritis it is highly injected, and either morbidly red throughout, with a disposition to elongation of the papillæ; or if partially covered with a fur, morbidly red at the tip and edges; peritonitis is most frequently accompanied by constipation, whilst the reverse is the case in enteritis. From *Colitis* or dysentery it is to be distinguished by the pain and tenderness not being limited to the course of the colon, by the absence of viscid slimy stools, scybala, tenesmus, and other symptoms of dysentery, by the pulse being less hard, and the tongue more injected than in colitis. In ordinary *Cholera Morbus* we have vomiting and purging of a matter which sooner or later presents a bilious character, often accompanied by cramps of the lower extremities, a combination of symptoms rarely observed in enteritis; in cholera morbus, neither the state of the skin, tongue or pulse, indicates the presence of secondary fever, as in enteritis; nor do the severe intermitting neuralgic or spasmodic pains of cholera bear much resemblance to the less violent griping pains of enteritis. Should the disease be occasioned by an intussusception, it is to be distinguished by the urgent sickness and vomiting, by the obstinate constipation or scanty serous and bloody stools, by the suddenness of the attack, and by the intensity and circumscribed character of the pain. When the obstruction results from some slow organic change in the gut itself, the history of the case, as well as some of the above symptoms, will often render its existence probable; under such circumstances, it will often be found that the patient has suffered from repeated attacks of obstinate constipation, probably attended with sickness or vomiting, and pain in some particular part of the abdomen.

We may almost venture to affirm, that as often as acute enteritis is unattended with a purging, there will always exist some doubt as to the real nature of the complaint, however strongly marked other symptoms may appear; and that this is scarcely less true in the case of the adult than in that of the child. In the latter, and especially during infancy, the drowsiness, stupor, and disposition to coma are sometimes such as to excite a suspicion of hydrocephalus, and it is only by a most attentive and careful investigation of the history and progress of the case that the most experienced can satisfy himself as to the real nature of the disorder, a task rendered more difficult by the circumstance of a disease now and then commencing as enteritis, and afterwards passing into actual hydrocephalus. Frequently, however, the mode of attack, as well as the progress of the disorder, will enable us to decide with considerable confidence; the heat of the scalp, the rolling of the head, the sickness and vomiting, the constipation, the contracted pupil, the headache in the child, and the knitting of the eyebrows in the infant, which precede or attend the early stage of hydrocephalus; to be followed by the dilated pupil, the slow, labouring or unsteady, and ultimately rapid pulse, the sighing or screaming and other well-known signs of hydrocephalus, will for the most part declare the presence of that alarming disorder; whilst the absence of many of these symptoms, and of the usual progressive changes of hydrocephalus, the different condition of the pupil, the susceptibility of the bowels to the operation of purgative medicines, will rather incline us to the conclusion that the case is one of enteritis. In infants, who can render no account whatever of their feelings, of course the diagnosis is still more difficult than in children; in the former, the principal means of diagnosis, in the absence of diarrhoea, are, the heat and tumefaction of the

belly, the frequent crying and drawing up of the legs, the pale face, the drowsiness, the red, dry and contracted tongue, and the sallowness about the lips.

The student ought at all times to bear in mind the possibility of the symptoms being the effect of, a hernia, an acrid or corrosive poison, or, the external application of some arsenical preparation to a broken or raw surface.

Prognosis.—The prognosis in acute enteritis is to be drawn from a consideration of the nature of the cause which produced it, its severity and extent, the age and constitution of the patient, and the period of the disorder at which medical assistance is sought. When it has been produced by the ordinary causes of the phlegmasiæ, when it occurs in young persons of good constitution, when, from the moderate degree of general disturbance and local pain we have reason to think that the inflammation is not very intense, and when we are called at an early period, the general prognosis is pretty uniformly favourable; but when, on the contrary, the inflammation is intense and extensive, when the patient is old, or of a highly scrofulous, cachectic or broken-down constitution, and when the disease has been early neglected, the general prognosis must be regarded as proportionably unfavourable, and especially so if the disorder have resulted from some acrid or corrosive substance taken into the stomach. In any individual case, the favourable symptoms are, a moderate diarrhœa without any very severe pains or griping, and without much tumefaction or tympanitic distention of the belly; a comparatively animated or natural appearance of the countenance; a warm and moist skin; a soft and moderately frequent pulse; and the tongue, although morbidly injected and red, being at the same time moist and white at the base and centre, or perhaps morbidly clean but without a disposition to become dry, and covered with a brown

or black fur ; and lastly, all the symptoms, however severe, gradually yielding to the remedies employed. The unfavorable signs are, a high degree of febrile excitement ; great tenderness and severe griping, with much tympanitic distention ; violent purging of thin, serous, or dirty-looking brownish or bloody stools ; constant nausea or repeated vomiting ; great faintness and prostration of strength ; a pale, shrunk and sallow aspect of the countenance ; rapid emaciation ; hollowness of the eyes ; a morbidly injected and at the same time dry, brown or black tongue ; a feeble, sharp and rapid pulse ; frequent dosing with the eyelids half-closed ; stupor, delirium, or coma : when the patient ceases to complain of pain, when the stools and urine pass off involuntarily, when the extremities become cold, the voice feeble, and the pulse small, thready and creeping, death for the most part soon closes the scene. When in infants the disease occurs in connexion with the irritation of dentition, and appears to be occasioned by the morbid changes and consequent acrimony of the ingesta, as indicated by the sour smell of the green water stools, the prognosis, if we are called early, is in general favourable ; but when, on the contrary, the disease appears to be unconnected with dentition, and is attended with profuse discharges of thin, serous or dirty-looking, or brown or bloody matter from the bowels ; or when with the irritation of dentition we have similar discharges, or no purging at all, a favourable result is at all times much less probable : in other respects, the prognosis in infants must be regulated by the same rules as are applicable to adults. In those terrible cases of acute enteritis in which the whole of the tunics are involved, including the peritoneum, although the disease may probably be more limited in extent, the danger is at all times great ; and as the majority of such cases are the result, either of some immoveable cause of phy-

sical obstruction; or, a consequence of mechanical violence; they are often all but hopeless: should it, however, occur independently of either of these two causes, the probable result must be judged of by the signs and circumstances already pointed out.

Treatment.—The treatment of acute enteritis consists chiefly in general and local depletion, warm fomentations and poultices, nearly total abstinence, and the mildest laxatives if constipation prevail, or absorbents and mild opiates if there be considerable diarrhœa, and in some instances, mercurials. When the febrile symptoms are strongly marked, or even when, without much fever, the local tenderness and griping are severe, a moderate general bloodletting will often be found of the most decided and lasting advantage; the quantity being determined by the age and constitutional powers of the patient, and by the effect produced. It will not in general be necessary to repeat the operation. If any doubt exist respecting the adoption or repetition of general depletion, the local abstraction of blood by means of leeches may at all times be substituted for it with the best effects. They may be applied to that part of the abdomen where the greatest tenderness is felt, or, in the absence of pain, to the regions of the umbilicus and cæcum: the number may vary from eight or ten, to twenty or thirty for the adult, and from one or two, to six or eight for the infant or child. If the strength permit, the bleeding may be encouraged by the subsequent use of a poultice or fomentation; upon the whole, however, it is perhaps better, especially in very young subjects, to allow the bleeding to stop, before applying the poultices or fomentations, and to repeat the leeching as often as it appears to be necessary. If constipation prevail, which is not very commonly the case when the patient is first seen, the bowels must be moved by some very gentle medicine, given by the mouth,

or, what is better, by emollient or demulcent enemata. As internal laxatives, two scruples or a drachm of magnesia; half a drachm of magnesia with ten grains of rhubarb; two scruples of magnesia and a drachm of Epsom salts; ten grains of rhubarb and a scruple of sulphate of potash; or a tea-spoonful or two of castor oil; are amongst the most eligible: as enemata, three quarters of a pint or a pint of thin gruel or barley-water, will sometimes prove sufficient; but if not, one table-spoonful of common salt and two of olive oil; or if they fail, a table-spoonful of castor oil, may be added. More commonly, however, the bowels are relaxed, and unless the diarrhoea prove very distressing, or appear to be greatly exhausting the strength of the patient, it is as well not to attempt to arrest it; but under the circumstances mentioned, it must be moderated by a little simple chalk mixture, made without aromatics, and given after each loose stool; or if unsuccessful, three or four minims of laudanum may be added to each dose; or with the chalk mixture three or four grains of Dover's powder, may be substituted in the form of pill twice or thrice a day, according to the urgency of the relaxation. The irritability of the bowels may sometimes be allayed by injecting about three parts of a pint of thin tepid gruel or barley-water into the rectum; or still more certainly, by throwing up two or three ounces of thin starch with from fifteen to twenty minims of laudanum, or half an ounce of syrup of poppies. In ordinary cases, mercurials are unnecessary as well as hurtful; but when the secretions are pale or muddy, or when from the history of the case, we have reason to apprehend a complication of inflammation or congestion of the liver, both of which supposed conditions are frequently met with, especially towards autumn, a mild mercurial will often be found of essential service. Some have given calomel and opium under such circumstances, but upon

the whole, if given by the mouth at all, probably two or three grains of hyd. \bar{c} ret., or one or two of blue pill, with three or four of Dover's powder, will answer better; still further guarding against intestinal irritation, by administering the chalk mixture at the same time, if necessary. In other cases, it will be safer, and perhaps scarcely less effectual, to apply the mercury by means of inunction; a drachm of the strong ointment being rubbed partly over the region of the liver and partly over the legs and thighs, night and morning. In every instance, it is not only desirable to abstain as much as possible from medicine to be given by the mouth, but also to be exceedingly cautious not to allow any but the most bland and simple forms of food and drink, such as a very little barley-water, and arrow-root in small quantities at a time, for the first few days: in short, there are few phlegmasiæ which during their progress, and during convalescence, require to be treated with so much gentleness and caution as acute enteritis.

When, however, enteritis is the result of an acrid or corrosive poison, it will in general be right to allow a much more liberal use of mild demulcents, such as barley-water, milk, gum-water or linseed-tea. When in the infant the disease appears to arise from the irritation of dentition, and is characterised by frequent loose and greenish stools, whether accompanied by gastritis or not, the utility of chalk as an antacid will be more decided than in ordinary cases met with in the adult; whilst the necessity of leeching will be less, as both the febrile disturbance and the local inflammation will often be found to subside on thus correcting the acidity of the primæ viæ; in other respects, making due allowance for age, the treatment of enteritis is much the same in the child and in the adult.

CHRONIC ENTERITIS.

Chronic Enteritis may be a mere sequel of the acute form of the complaint, when proofs of its presence will for the most part be sufficiently satisfactory and conclusive; but in a large majority of reputed cases of chronic enteritis, the disease makes its approach in a slow, insidious, and imperceptible manner, so as either to be altogether overlooked when it exists alone, or to be rendered extremely obscure by some more prominent disorder, when it happens to be an accidental complication, or merely a secondary consequence of that disorder. It often coexists with a corresponding state of the mucous membrane of the stomach, constituting the chronic gastro-enteritis of modern writers. In its most decided form, it is characterised by a greater or less number of the following symptoms; a deep dull pain in some part of the abdomen, but especially about the umbilicus, perhaps increased by firm pressure, by stumbling, riding on horseback, or any sudden or considerable exertion; or by stimulating food and hot liquids; this pain may be more or less constant with occasional aggravations; it may only be felt at longer or shorter intervals; or it may even be altogether absent: there are generally more or less flatulency and distention, attended with griping pains, which appear to be readily induced by indulging in acid food or drink; and in many instances a degree of tenderness of the abdomen over the part where the griping is most felt: the bowels are irregular, being sometimes costive, sometimes loose, or these two states alternate with each other; the stools are pretty uniformly of unnatural appearance, being sometimes mucous or slimy, sometimes pale or clay-coloured, or perhaps exceedingly dark or greenish, and exceedingly offensive: the tongue is generally red or injected in its substance and

foul on its surface; the patient often complains of clamminess or dryness of the mouth, with thirst; his appetite is commonly impaired, sometimes natural and at other times remarkably craving. As the disease advances, the constitutional effects become apparent; the patient loses flesh and strength, he is low-spirited and readily fatigued, the skin becomes dry and harsh, the countenance sallow, the tongue, perhaps, apthous as well as foul, the urine scanty and high-coloured, the appetite is lost, and probably a vague and irregular hectic supervenes, characterised by a quick but feeble pulse, occasional flushings and partial perspirations. Under a greater or less number of the above symptoms, with or without the superaddition of those of chronic gastritis, patients may live for months or even years, and then probably be cut off by a sudden aggravation of the disorder, attended with uncontrollable diarrhœa, or diarrhœa and vomiting; or he may speedily sink under some secondary affection, or from a casual attack of some ordinary disease, in consequence of his enfeebled constitutional powers being no longer capable either of resisting disease, or permitting the use of appropriate remedies.

Morbid Appearances.—In investigating the morbid changes produced by chronic enteritis, it must be borne in mind, that there is nothing more fallacious than the appearances presented by a mucous membrane after death; it being extremely difficult, if not absolutely impossible, to determine with certainty what is the result of previous inflammation, and what is merely cadaveric; for on the one hand, a red and injected condition of the membrane is not unfrequently discovered after death, in cases where there had been no reason whatever to suspect the previous existence of enteritis; whilst, on the other hand, notwithstanding the most manifest symptoms of an inflamed state of the mucous membrane before death, no satisfactorily

conclusive indications of such a condition have been discovered on afterwards examining the dead body of the patient. It has indeed been alleged, that merely cadaveric redness may be recognised by its being limited to the most depending portions of the intestines, by the uniform stain of the membrane, and by the existence of some manifest cause of congestion; but in truth, even these supposed tests of the absence of inflammatory changes are insufficient and inconclusive. Suffice it to say, that in general, the mucous membrane has been found reddened, the redness being usually of a deep or dingy hue, or occasionally brownish, or with a blueish tint; this redness is sometimes continuous over a considerable surface, at other times it occurs only in patches; or, in consequence of the edges of the valvulae conniventes being most affected, arranged in streaks marking the situation and direction of these folds of the mucous membrane. With this redness, the membrane is sometimes manifestly thickened, softer and more separable from the subjacent tissue than natural; but to this state there are exceptions; its surface may be preternaturally dry, or covered with a viscid or tenacious mucus, and occasionally presents a greater or less number of variously sized abrasions or superficial ulcerations. The mucous glands, though frequently, on the whole are not in general very considerably enlarged, and ulceration of them in ordinary cases is still more rare. The intestine is in some instances found remarkably contracted in its calibre, although without much actual thickening of its parietes beyond what results from such contraction; in others, the inflamed intestine is observed to be distended with flatus. These morbid appearances of the intestine are not unfrequently found to be accompanied by a corresponding condition of the mucous membrane of the stomach; or of the caecum and colon; or by the appear-

ances which result from chronic inflammation of the liver, or of the mesenteric glands.

Causes.—Chronic Enteritis may occur at any period of life, and in either sex, but chiefly in individuals of a delicate, irritable, and scrofulous habit of body: it is perhaps most commonly met with in infancy and childhood, during which periods it frequently presents the phenomena of infantile remittent fever, tabes mesenterica, and that disorder of the primæ viæ usually regarded as being connected with or occasioned by the presence of worms: in youth and middle age it is most liable to commence in the summer and autumn months; whereas, in advanced life, it chiefly attacks persons who have led a dissipated and irregular life. Independently of its proving occasionally a mere sequel of the acute form of the complaint, the *Exciting Causes* are numerous; the most obvious and prevalent of these is unquestionably excesses in eating and drinking, but especially long-continued indulgence in high-seasoned and other stimulating food, and copious libations of wine or spirituous liquors; it would appear also to arise occasionally from unwholesome or even too scanty diet: a large proportion of cases seem to result from an acrimony, excess, or defect of the ordinary abdominal secretions, and especially that of the liver; it may be produced by the mechanical irritation of indigestible substances taken into the stomach; by acrid or corrosive poisons; by the frequent use of purgatives, especially of the more drastic kind; by irritating medicines generally; by the internal or external use of arsenic; by partial or general exposure to cold; by living in a damp and insalubrious situation; by the suppression of some accustomed discharge; and in infants at least, by acidity or other morbid changes of the ingesta; it is sometimes excited by burns or scalds; it frequently follows in the train of small-pox, measles, scarlet-fever, and

gout; and is one of the most familiar complications of erysipelas, chronic gastritis, certain chronic cutaneous disorders, and of disease of the viscera generally, but especially of those of the abdomen.

Diagnosis.—It must be acknowledged that in a very large proportion of cases of chronic enteritis, our means of distinguishing or recognizing the disease, are in a great measure negative: when pain, uneasiness, flatulency, distention, and occasional diarrhoea are observed, it may not be difficult to satisfy ourselves of the existence of the disorder, and especially so if these symptoms happen to be accompanied by others which are occasionally present. In many cases, however, of reputed chronic enteritis, we fail entirely to discover these more prominent and more decisive symptoms; and even when present, considerable doubt may still be entertained as to whether they result from mere irritation, or from morbid sensibility of the intestinal tube, altogether independent of actual inflammation; distinctions to which some have attached much importance in a practical point of view, inasmuch as in purely chronic enteritis purgative medicines have been very generally condemned as hurtful, whereas in cases of mere irritation of the intestines, although characterised by the ordinary symptoms of chronic enteritis, purgatives, by removing the irritating contents of the bowels, or by tending to correct morbid abdominal secretions, have been found to be amongst the most speedy and effectual means of cure. To decide positively in all such cases, we hold to be impossible in the present state of our knowledge; neither do we consider it of any very great practical importance, as gentle laxatives are by no means so injurious, even in the most decided cases, as some have been disposed to represent: when, therefore, the appearance of the alvine discharges leads us to apprehend that the disease is produced or kept up by

morbid secretions, or by the retarded passage of the ingesta through a torpid bowel, the case may be fairly and safely tested by the employment of laxatives and mild mercurial alteratives; when, if they prove highly irritating or otherwise injurious, however cautiously exhibited, it will be time enough to regard the case as one of simple chronic enteritis. But chronic enteritis not unfrequently exists, or is represented to exist, without any of the more prominent symptoms just enumerated; in such cases, the sources of a correct diagnosis are chiefly negative: when a patient complains of general indisposition, languor, and depression of spirits; when his appetite is impaired or capricious; when his tongue is injected in its substance, or perhaps red at its tip and edges, and partially covered with a white or yellowish fur; when he complains of dryness, clamminess, or bitterness of the mouth, with more or less thirst; when he looks sallow and loses flesh; when his skin becomes dry, harsh, and probably covered with a sort of minute branny exfoliations of the cuticle; and when the bowels are irregular, and the alvine discharges unhealthy; we ought at all times to suspect the presence of this disorder: and if, after a careful examination, we discover no lurking organic disease in any part of the body, it will at all times be safe at least, if not uniformly correct, to conclude that the case is one of chronic enteritis, and to treat it accordingly. It must nevertheless be remembered, that the symptoms very closely resemble those of chronic gastritis and chronic hepatitis, two diseases which frequently coexist with chronic enteritis; nor must it be forgotten, that malignant disease or latent suppuration in any part; fatty degeneration of the liver; phthisis pulmonalis; psoas abscess; disease of the kidneys; and diabetes; all occasionally induce a state of general disturbance which may lead to a mistaken belief that the patient is affected with

chronic enteritis; and more especially so, as most of them are in their progress liable to become complicated with the latter disorder.

Infantile remittent fever; most cases of tabes mesenterica; and of the derangement connected with the presenee of worms, are so intimately connected with chronic enteritis, that, in a practical point of view, they may almost with safety be regarded as mere modifications of that disease.

Prognosis.—When assured of the existence of chronic enteritis, and that it is not complicated with organic or other serious disease of important organs, although recovery may be tedious, the prognosis is generally favourable, provided the patient will conform to the regulations laid down in regard to his diet and regimen; and especially if, with obedience to rule on the part of the patient, we have the good fortune to be called at an early period of the disorder: but when the disease is of long standing, and has already made serious inroads upon the constitution, as shown by the sallow and shrunken countenance; the emaciated frame; the dry, branny, and shrivelled skin; the total loss of appetite; the sharp and feeble pulse, and the very irregular state of the bowels;—the prognosis is doubtful, or, perhaps, in the generality of such cases, positively unfavourable; the danger being still further enhanced by the patient being old or of a cachectic habit of body, whether from intemperance or any other cause; and by the disease being complicated with obstinate diarrhœa, or some other important disorder. In any individual case, the favourable symptoms are, the gradual subsidence of the pain, uneasiness, and flatulency of the abdomen; an improved appearance of the stools; returning appetite, and easier digestion; a more healthy complexion, with greater expression of animation in the countenance; the tongue becoming less injected in its substance, and less foul on its surface; the

pulse slower, fuller, and softer; and the skin moister and less sealy; together with a gradual recovery of flesh and strength. Of course the reverse of these is to be regarded as unfavourable, whilst an all but hopeless case will be indicated by extreme emaciation; a morbidly clean, smooth, tender, and aphthous tongue, or an aphthous condition of the internal mouth generally; by a total loss of appetite, and lingering hectic; under which circumstances, the patient may either sink from complete exhaustion, or he may be cut off by a sudden accession of diarrhœa, or by the supervention of some casual and, perhaps, comparatively trifling disease.

Treatment.—The treatment of chronic enteritis will consist chiefly in endeavouring to procure regular and healthy discharges from the bowels; in regulating the diet and regimen of the patient; and in carefully avoiding the exciting causes. It is rare indeed that any general depletion will be required; and although the employment of leeches has been strongly recommended by some, they are, we believe, very seldom necessary. Should, however, the activity of the symptoms, such as diarrhœa, griping or local tenderness, appear to indicate the propriety of this form of depletion, from two to eight or ten leeches, according to the age, may be applied to the abdomen, followed by a warm poultice, if the strength of the patient permit. Some prefer their application to the anus; and undoubtedly they often appear to prove of considerable service when so applied; but, upon the whole, it will be found scarcely less advantageous, and much more agreeable to the feelings of the patient, to apply them in the usual way. Purgatives, especially of the active kind, have been strongly condemned, and by some almost absolutely prohibited, from an apprehension that they are calculated by their action upon the inflamed membrane to aggravate the complaint; but

although on such theoretical grounds, purgatives have been confidently proscribed, and although the more active or drastic purgatives, without a doubt, can hardly fail to prove pernicious, we cannot help concluding that too great a prejudice has been thus created against the use of laxatives in general. When the disease is a mere sequel of acute enteritis; when the stools, though loose, are of natural smell and colour; and especially when there is considerable tenderness of the belly; it is not improbable that even the mildest laxatives might do harm; but when, on the contrary, the bowels are confined, or when, if loose, the discharges are unhealthy in appearance, we know that gentle laxatives, so far from being prejudicial, often prove the most efficacious remedies we can employ. In such cases, indeed, it is probable that the inflammation itself is intimately connected with, if not entirely dependent upon, either the presence of morbid secretions, or a torpid state of the alimentary canal, and consequent accumulation of the ingesta. Be this as it may, it is a very good practice, when the bowels are confined, or when the discharges are unhealthy, to commence the treatment by the exhibition of a mild laxative, such as two scruples or a drachm of magnesia; or a scruple of rhubarb; or about half a drachm of the former with ten grains of the latter; or a gentle dose of senna and salts. When there are but inconsiderable signs of irritation present, the *hyd. c̄ cretâ*, to the extent of three or four grains, may be given at first, and followed, in four or five hours, by a little castor oil, or senna and salts; or even three or four grains of calomel, with ten or twelve of rhubarb, may be substituted. Enemata do not in general prove so beneficial at the commencement, as a laxative which passes through the whole of the intestinal tube; but at a later period they may be employed occasionally instead of medicine by the mouth, and with good effect. The pro-

priety of repeating the laxative must be determined by the result of the first dose, and by the appearance which the discharges continue to present. Should a diarrhoea remain after the operation of the laxative, it may be moderated by a couple of table-spoonsful of chalk mixture occasionally. Another very important remedy in some cases, and one which has also, like purgatives, been strongly and almost universally condemned by some, is mercury in moderate doses. The same rules, however, drawn from the presence of constipation and morbid discharges, must guide us in this respect. When the bowels are confined, and the discharges unhealthy in smell and colour, from half a grain to a grain of calomel, with from five to eight grains of dried carbonate of soda, may be made into a powder, and taken in a little gruel twice a day with perfect safety and great benefit; or, if the bowels are more irritable, two, three, or four grains of hydrarg. c. eretâ, with or without eight or ten of chalk, or two or three of Dover's powder, may be substituted for it; the effect of these adjuncts being promoted, if necessary, by the occasional use of chalk mixture. In short, the object in such cases is to remove morbid accumulations, and correct morbid secretions. The propriety of using or abstaining from laxatives and mercurial alteratives, constitutes the most important as well as the most difficult question in reference to the treatment of chronic enteritis; for as soon as this has been decided, little more will be required than to regulate the patient's diet and regimen, and explain to him how he can best avoid the exciting causes. His diet should be plain, but generous according to his strength and previous habits, and divested of whatever is calculated to irritate the alimentary canal. He should therefore abstain from all high-seasoned and otherwise stimulating food and made dishes; from all indigestible articles, such as pork, ham, and other salted meats;

pickles, rich pastry, shell-fish, stone and raw fruit, and undressed vegetables in general; instead of which he should confine himself chiefly to farinaceous food, plainly-dressed meat, fowls, and game when not too high: and as regards drinks, of whatever kind, they should be moderate in quantity, and may consist of barley-water, toast-water, sugar and water, gum-water; or, if the strength require it, and it do not disagree, a little ale or porter, with or without half the quantity of soda-water, once or twice a day: the light, acidulous wines often disagree; and all spirituous liquors are in the end hurtful. In short, the rules of diet to be laid down, under the head of dyspepsia, must be rigidly observed. As soon as the secretions have been corrected, the appetite and strength may often be materially promoted by the use of mild tonics and bitters, such as the infusions of gentian, columba, cusparia, or orange-peel, with eight or ten grains of sesquicarb. sodæ, or bicarb. potass., and a little aromatic tincture twice or thrice a day; or the sulphuric or muriatic acid may be substituted for the alkali; or a little quinin. disulph. may be given with one of these acids in the decoct. sarzæ co.

The patient may take a warm bath twice a week; he should go well-clothed; be regular in his exercise and rest; enter into cheerful society; and, if possible, retire to the country, and enjoy the benefit of change of scene.

INFLAMMATION OF THE CÆCUM AND APPENDIX VERMIFORMIS.

That portion of the intestine which is lodged in the right iliac region is frequently the seat of inflammation, and affords peculiar symptoms, with which it is right that the student should be well acquainted. The history of this affection is often as follows:—The patient has complained,

more or less, for some time past, of pain and uneasiness in this part, increased on exertion, or after neglect of the bowels, or excess in eating or drinking; he has, however, retained such a share of health, that he has not been interrupted in his daily avocations, till, after some unusual exposure to cold, or some long walk, or other over-exertion, he has been suddenly seized with more severe pain, attended with rigors, chills, and sometimes with sickness and violent vomiting. The pain and tenderness become excessive, and extend to the neighbouring parts of the abdomen. A hardness and tumefaction are soon very evident to the hand in the part first affected: this continuing, general symptoms of peritonitis often take place, and terminate fatally; but under careful treatment, the inflammation remains circumscribed, and becomes even less extensive, assuming the form of a local, deep-seated abscess. The threatening symptoms of peritonitis subside; the tumefaction just above the crest of the ilium on the right side is more and more obvious to the touch, and gradually shows a tendency to point; the constitution still suffering severely. In process of time it either opens of its own accord, or is assisted by the lancet, and a discharge of ill-conditioned pus follows, which, from its peculiar fetid smell, and from its appearance, is soon discovered to be mingled with feculent matter. The discharge continues for many weeks, and the patient often sinks at length from exhaustion. In other cases, when the powers of the system are previously unbroken, the abscess closes, and permanent recovery is obtained.

Morbid appearances.—From numerous dissections it is proved that the faecal abscess thus formed in the right iliac region arises, in a large majority of cases, from disease set up in the appendix cæci. It is found that this organ is very subject to inflammation, to ulceration, and even to gangrene; and, moreover, that it is occasionally thickened

and ulcerated from tubercular deposits, if the peculiar diathesis favours that change; so that this little worm-like body is often detected in the midst of the abscess, with a perforation at its extremity; or by ulceration higher up in its parietes, a considerable portion of it, nearly or entirely separated, is found in a disorganized condition amongst the pus and fæces which fill the abscess. In other cases the appendix is truncated within a short distance of its origin from the cæcum. In a smaller number of instances the cæcum itself is found inflamed and ulcerated, and extensively implicated in the abscess, in a way which shows that the appendix had little to do with the disease.

According to the circumstances under which the patient has died, the extent of the abscess will be greater or less; it will be more or less circumscribed, and more or less complicated with diffused peritoneal inflammation. It is but seldom that the abscess is very perfectly insulated; for the nature of the matter which it contains does not favour the production of a healthy adhesive process; but still it often becomes circumscribed towards the cavity of the peritoneum, while it burrows behind that membrane, and finds its way into the surrounding cellular substance; so that it sometimes points at a considerable distance from the original source of the disease.

Exciting causes.—It is possible that the secretions of the appendix itself may sometimes become diseased, and give rise to inflammatory action in the part; sometimes we can plainly discover that stricture, amounting even to occlusion of the cavity, has taken place, so that the extremity has been distended with its own secretions; and this may probably give rise occasionally to inflammation: at other times we find little oval masses of fæces impacted in the canal, which have pretty obviously produced the irritation: sometimes a foreign substance, as a cherry-stone, or other seed,

has been detected in the appendix: but one of the most common causes is undoubtedly the formation of a peculiar concretion which is moulded to the extreme cavity of the canal, and which is composed of coats or layers of the earthy phosphates, with occasional alternate layers, probably, of animal secretion or of feculent matter. Although a fæcal abscess forming in the right iliac region will, as we have said, generally be the result of disease in the appendix, yet in some cases the mischief is found to have originated from inflammation of the cæcum itself, or of the cellular tissue in its immediate vicinity. That viscus, from its peculiar structure, and probably from the fact of its function requiring a certain delay of the fæcal matter in its cavity, is very liable to suffer from irritation and inflammatory action, which would appear to be occasionally communicated to the cellular substance by which it is bound down, or to the portion of the peritoneum and parietes with which it is held in constant contact; indeed the injurious causes to which the cæcum is exposed correspond very nearly with those of the appendix; for we find in it, likewise, the secretions vitiated; and we find foreign matters, such as plum-stones, and other hard and indigestible substances, lodging in it, till inflammation is produced; and in some districts of the country we have concretions generated in the cæcum, of a character very analogous to those which produce so much disease in the appendix, formed like them of alternate layers of the earthy phosphates, and of some fæcal matter; and as these concretions generally occur in districts where the oat constitutes the principal aliment, the intermediate layers have been found chiefly composed of the fine hairs which belong to the internal husk of that grain, collections of which have appeared to be the original exciting cause of the irritation in the cæcum. These concretions frequently increase to a very large size, filling the

head of the cæcum, and, as may well be supposed, excite the greatest irritation, leading to thickening and ulceration of the different tunics of the intestine.

Diagnosis.—The situation of this disease in the right iliac fossa, will often sufficiently point out the probability of its nature ; yet it will require much tact, and the habit of such observations, to decide with certainty from this alone ; and the chance of error will be the greater, because, owing to the occasional burrowing of the abscess, it may become most prominent at some distant part ; so far in the loins, for instance, as to suggest the idea that the kidney is implicated, or so high up, that, if some surrounding hardness should occur, it may be referred even to the liver, or so far towards the pubes, as to render it not impossible that the tumor may depend upon disease of the pelvic viscera. Moreover, an abscess situated as this is will often produce symptoms not unlike those which exist in nephritic attacks,—a pain and numbness down the thigh, and a retraction of the testicle ; which, coupled with the sickness and the pain or tension extending towards the loins, will render the diagnosis, in some few cases, still more difficult. In general, the manifest irritation, or the deranged action, and even the constipation of the bowels, will assist us in distinguishing such a fæcal abscess as is the present subject of consideration, from every disease of the kidney and liver, and likewise from abscesses formed in the parietes of the abdomen ; whilst in this we shall be still further aided by the absence of some symptoms peculiar to the other forms of disease ; we shall perceive neither blood nor pus in the urine, nor will its quantity be greatly reduced or greatly augmented, as might be expected if the kidney were involved ; nor shall we observe the jaundiced complexion, or the yellow conjunctiva, or the dark yellow urine, which attend upon hepatic disease.

Our *prognosis* will depend very much on the general health of the individual, and the time of life; and if both be favourable, the disease, though always of a most doubtful and dangerous character, will often slowly yield to cautious treatment. In the individual case, the more favourable indications will be found in the mildness of the general symptoms, and the absence of peritoneal inflammation; whereas, if the contrary should be the case, the abdominal tenderness become extreme, the prostration great, and sickness, purging, and hiccup supervene, our hopes of recovery will of course diminish; and whenever a faecal abscess has established itself, we are certain that the patient has to undergo a tedious process in which the strength may gradually give way, or many casualties may arise, to give a more sudden unfavourable turn to the disease.

The *treatment* in this disease is both general and local. The former must be regulated by the degree of constitutional affection, and the extent of inflammatory action. If these are considerable, general bleeding will be requisite in the early periods of the attack; and leeches should be freely applied to the part, followed by the assiduous use of fomentations and poultices. The bowels must be unloaded by mild but effectual purgatives; and these must be assisted by injections of soap and water, or gruel, or other bland liquids, in sufficiently large quantities to favour the complete emptying of the large intestines. At the same time we must endeavour to disturb the part as little as possible; for although, from the situation of the local disease, and the comparatively fixed character of the viscus, which is generally involved, there is less probability of the contents of the intestine or of the abscess becoming extravasated into the peritoneal cavity; yet this may happen if much violence is done in our manual examination; and we must always hold in mind, that though our first object must be so

to allay the inflammation as to prevent the formation of an abscess, yet much more frequently we shall be called upon to prevent an ulceration and abscess, which are inevitable, from doing essential and extensive mischief. As soon as the abscess has approached the surface, it must be carefully opened, and without any violent manipulation, must be encouraged by poultices to discharge its irritating contents, that the surrounding parts may assume, as quickly as possible, a healthy condition. In the mean time, the action of the large intestines must still be encouraged by mild injections, and the general health must be supported; and if the age and constitution be favourable, the abscess will after a time be closed. Should the peritoneum, in the earlier or later part of the progress of the disease, become inflamed, the treatment must be conducted as in other cases of peritonitis.

HEPATITIS.

By HEPATITIS is understood inflammation of the liver. The term is more properly restricted to inflammation of the substance of the organ; but it is also frequently applied where the peritoneal covering is alone affected. This inflammation may be more or less acute, or it may be chronic. It will be well in the first place to speak of the symptoms of inflammation affecting the peritoneum of the liver; next to describe the acute inflammation of the substance of the organ, and afterwards the sub-acute form; reserving the more chronic morbid actions to which the liver is subject, till we treat the subject of dropsy.

ACUTE INFLAMMATION OF THE PERITONEAL COVERING OF THE LIVER.

The symptoms of this disease are, in the first place, tendency to rigor, or chills and heats, followed by acute pain in

the region of the liver, greatly increased by pressure, by respiration, by laughing, or any exertion which throws the diaphragm into action; and hence an unwillingness to fill the chest, and consequently shortness of breathing, and occasionally slight cough; pain sometimes extending towards the right shoulder, or between the shoulder-blades; perhaps nausea or vomiting; a frequent, hard, but generally a contracted pulse; white tongue, inclining to dryness; and a slight yellow tinge of the conjunctiva.

The chief *exciting causes* are, exposure to cold; injuries from blows and falls; and inflammation of neighbouring parts. Sometimes the peritoneum of the liver suffers only in common with other parts of the same membrane: some of the exciting causes, however, act more upon that portion of the peritoneum covering the liver than upon other portions of the membrane. The resistance made by the liver renders the peritoneum more liable to suffer from accidental causes of violence. On the other hand, inflammation of the lungs is very apt to influence the convex surface of the liver, while affections of the ducts, and other structures in the neighbourhood of glissons capsule, occasionally affect the concave surface.

Morbid appearances.—The most common result of inflammation in this part is adhesion of the liver to the diaphragm by bands of greater or less length and solidity; sometimes more filamentous threads; sometimes broad membranous attachments; sometimes firm and round cord-like adhesions; sometimes the liver and the diaphragm adhere closely; and sometimes a layer of less completely organized matter separates the two surfaces. When the inflammation has been more recent, we sometimes find a thin film of coagulable matter lying on the surface, and capable of being removed; and it frequently happens that these decided evidences of recent or former inflammatory action are disco-

vered after death, when there are no traces of inflammation to be found in other portions of the peritoneum.

Diagnosis.—The local pain and tenderness which are the prominent features of this affection, may depend on other causes, and are therefore liable to be mistaken. Amongst these affections, the chief are, pleuritis; the neuralgia of hysteric females; the pain preceeding and following herpes zoster; flatulent or other distentions of the ascending colon and its arch; and rheumatic affections of the muscles.

The presence of *pleuritis* is often difficult of detection when situated near the diaphragm. Its existence can alone be ascertained by the most careful observation of the precise situation of the pain, as pointing to the probability of its being above or below the diaphragm; and an attentive analysis of the stethoscopic signs; the presence or absence of those sounds emitted by the voice, when effusion, in a larger or less degree, has taken place within the chest; and the influence on the respiration. As, however, the inflammation of the convex surface of the liver is occasionally the result of inflammation within the chest, this will sometimes render the diagnosis still more difficult. *Hysteric neuralgia* is generally betrayed by the history of the patient; the variable nature and situation of the pain; the tenderness discoverable on other parts of the body, where neither peritoneum nor other serous membrane can be implicated; the presence of leucorrhœa or of amenorrhœa; or the general incongruity of the symptoms. The pains which precede, accompany, and follow *herpes zoster*, are of a peculiar lancinating and burning character; and though sometimes excited by gentle pressure, or by passing the hand lightly over the part, are usually very severe when no pressure is made; and they are seldom confined to those parts which have connection with the peritoneum, but extend over the chest or other portions of the surface; and of

course the appearance of the eruption, or the marks left after its passing away, will always obviate all mistakes of diagnosis in more advanced cases. *Flatulent distention* of the intestines will be relieved rather than aggravated by gentle continued pressure; while the sound of the part, on percussion, as well as the sensation communicated to the hand, will confirm the opinion which we shall have already formed from the absence of febrile and inflammatory symptoms, as indicated by the pulse and tongue. *Rheumatic affections* of the muscles are generally to be distinguished by the character of the pulse, its fuller volume, and less tense feel; also by the more loaded, white tongue, and the variable situation of the pain or tenderness, which is apparently more deep-seated in the muscles and tendinous expansions than the neuralgic pains, and more wandering and inconstant than those connected with the peritoneal coat of the liver.

The *prognosis* of peritonitis, confined in this way to the liver, unless complicated with inflammation within the chest, or with inflammatory affection of the substance of the liver, is generally favourable, although it may probably not terminate without the formation of adhesions, more or less extensive, to the neighbouring parts. The favourable circumstances in each case will be the gradual cessation of the pain and febrile symptoms; while an unfavourable result may be feared if the inflammation should extend so as to involve the peritoneum more extensively,—affecting the stomach and other viscera in its course.

Treatment.—This varies in nothing from that which has been recommended for acute peritonitis, except that in general the means required will be less varied, or of shorter continuance; though the most energetic practice should never be neglected at the onset to cut short inflammation, however small may be its extent, occurring in any portion

of the peritoneum. Of course, the local depletion, as well as counter-irritation, must be directed to the region of the inflamed organ.

ACUTE HEPATITIS.

When the substance of the liver is inflamed, the general symptoms often put on the most severe character from the beginning, though the seat of the inflammation may be obscure. Chills, and flushes of heat, are soon succeeded by severe rigors, and intense headache; the pulse very frequent and full; the skin hot; or, if the rigor is excessive, bedewed with a profuse perspiration, which gives little relief; the tongue is covered with a thick fur, at first white, but quickly assuming a more yellow colour, while the sides and tip are of an unnatural redness. There is sometimes little reference of pain to the region of the liver till deep pressure is made, and then the pain is considerable; at other times the pain in the right side is early complained of, and is even intense; or, at all events, is felt on changing the position of the body, or making accidental pressure; and frequent complaint is made of a peculiar, wearing pain at the lower angle of the scapula. The stomach often sympathizes, and urgent vomiting is early experienced. The matter ejected is tinged with bile, and the patient complains of its bitter taste. In other cases the stomach is perfectly tranquil, though all desire for food is lost. The urine is scanty, high-coloured, with a yellow tinge, and letting fall a dark red or purple, lateritious sediment on cooling. The dejections are generally dark, and loaded with bile, though sometimes scarcely altered from the natural appearance.

If remedies are early and energetically applied, all these symptoms may be considerably relieved within eight-and-forty hours; but if this has not been the case, or if the se-

verity of the disease be such as to defy our remedies, it is apt to assume somewhat of a remitting character. The conjunctiva and skin, which have frequently at the commencement been perfectly free from any thing like the jaundiced tint, now become slightly yellow; and this is subject to very rapid variations. Morning and evening exacerbations are observable in all the symptoms; and in a few days irregular rigors, often of the most distressing violence, begin to take place, returning once, twice, or thrice a day, but generally without observing any decided or regular periods.

The bowels often become irregular, and are apt to run into a state of diarrhœa. The disease assumes more and more the character of low fever, with remission; the pulse rapid, and more feeble; the tongue brown, with red edges; the teeth covered with a tenacious black secretion: and to all this is added those dreadful rigors, at the approach of which the patient often expresses the greatest horror; and they are followed by profuse perspiration; the abdomen becomes more tender; the liver is more decidedly to be felt below the margin of the ribs; it is exquisitely tender to pressure, and may or may not present projections or irregular elevations on its surface: and now the stomach becomes more irritable, and frequent hiccup takes place; and all this succession of painful symptoms will often continue for three or four weeks, when the patient at length sinks, worn out with suffering: the urgency of particular symptoms depending in a great degree upon the part of the liver which is the chief seat of disease, and the consequent proximity of the diaphragm, the stomach, or other organs. The pain experienced appears greatly influenced and modified by the situation of the inflammation. Probably where the substance of the liver is exclusively inflamed, without involving the peritoneum or other more sensitive parts, the pain is very trifling; for in some cases the most formidable

suppuration of the liver has been found after death, which had been accompanied by no pain sufficient to call the attention of the patient or the practitioner to the seat of disease.

It occasionally happens that an abscess points externally, in some part of the abdomen, generally not far from the margin of the ribs in the right hypochondrium, or even between the intercostal spaces; and a quantity of fœtid matter is discharged; and after a time, longer or shorter, the patient slowly recovers. At other times a gush of fœtid matter is thrown up by coughing; and purulent expectoration, after continuing for weeks or months, at length subsides, and perfect recovery takes place; or frequently a large quantity of pus escapes by stool from the intestines, continues for days, and gradually subsides. In other instances the abscess has burst, and poured its contents into the cavity of the peritoneum, thereby exciting a speedily fatal peritonitis; whereas, in more fortunate cases, when remedies have been early applied, and suppuration prevented, though the disease may be protracted, the patient completely recovers.

Acute hepatitis, going on to suppuration, is often combined, in tropical climates, with fever, of which it modifies the type and symptoms; but still more frequently it is combined, either as cause or as consequence, or perhaps by simultaneous inflammation, with acute attacks of dysentery, and either amidst the agonizing pains of the dysentery it is overlooked, or it adds new symptoms, and greatly increases the danger of the disease with which it is complicated.

Morbid Appearances.—On opening the abdomen, the liver is seen projecting below the margin of the ribs; it may be only of a dark or mottled huc, and not otherwise obviously altered until the parts hidden beneath the dia-

phragm have been brought into view ; or the part, as first seen, may present certain discoloured projections, immediately suggesting the idea of abscess ; and the first cut of the scalpel is followed by an abundant flow of yellow tenacious pus, sometimes of the most overcoming fœtor : this is followed by more discharge of a less healthy appearance, mingled probably with the shreds and portions of disorganized liver. And when incisions have been fairly carried through the whole viscus, half a dozen or perhaps fifty other abscesses, in different stages of progress, are divided ; or the first opened may be the only one. On examining these abscesses more minutely, it is seen that they are each formed from a cluster of minute abscesses or suppurating points, which generally show themselves in irregularly spherical clusters, and, gradually enlarging, coalesce, as if each of the acini had been a separate centre of inflammatory action. The veins near the abscesses are often found filled with coagula, with traces of pus. The peritoneum may or may not show marks of inflammation ; but if any of the abscesses have approached near to the surface, it will most likely be slightly attached by a film of false membrane, either to the diaphragm or to the parietes ; and a few drachms of yellow and rather tenacious fluid will probably be found in the more dependent parts of the abdominal cavity.

We often discover, either when no history can be obtained, or when some indistinct account of former inflammation is to be traced, such appearances as may be presumed, almost without doubt, to have arisen from previous acute inflammation, going on to form abscess, which had become circumscribed and nearly absorbed. In these cases, a distinct depression, of considerable depth, is often found, with a puckered appearance of the surface ; and

when an incision is made, a yellow mass, sometimes like curd, sometimes almost cartilaginous, or with earthy particles in its substance, is found immediately below the external depression; the surrounding peritoncum is thickened and opaque, but in general not attached to the neighbouring parts by adhesions. In cases where there has been no doubt, by the quantity of foetid pus thrown off, that in the present or previous attacks abscesses have been discharged through the lungs or the intestines, adhesions must of course have been formed; and distinct traces of such operations present themselves, on dissection, more or less altered and obscured, according to the time which has elapsed.

Causes.—A predisposition to this disease is undoubtedly produced by long-continued residence in hot climates; by exposure to the miasmata arising from stagnant waters, and damp, unwholesome situations, and warm and moist seasons; by the habitual indulgence in over-stimulating food and drink; and by the long-continued action of the depressing passions. The *exciting causes* are, generally, the alternations of heat and cold and moisture; from temporary exposures when the body is over-heated or fatigued, or otherwise predisposed; unusual excesses, in bodily exertion, in eating and in drinking; strongly excited passions; or the neglected condition of the bowels.

Diagnosis.—This disease may at first view be easily mistaken for inflammation within the chest, more particularly if the peritoneum lining the diaphragm is considerably involved, or the diaphragm itself inflamed. When the inflammation belongs more decidedly to the concave portion of the liver, and the irritability of the stomach is consequently great, the disease may be confounded with gastritis, and it may under some circumstances be taken for fever,

either of the remitting or the true intermittent, or even of a continued character.

With regard to *pleuritis* or *pneumonia* affecting the lower part of the right lung, these are to be discovered by the careful appreciation of the stethoscopic signs; the pain is likewise usually more intense on inspiration; there is more of cough, and less reference to the abdominal disturbance, when the chief mischief is within the chest: while in *gastritis*, the frequent and almost constant vomiting; the unusual depression of the vital powers; the feeble, and sometimes almost imperceptible pulse; and the situation of the pain on pressure being more towards the left side, are all circumstances which afford very strong grounds for our diagnosis. From *fever* we are enabled to distinguish this disease by the first symptoms of its attack, which are altogether those of inflammation of some important organ; nor does the countenance, in the earlier periods, assume any thing of the aspect which belongs to pure fever; and when, in the more advanced stages, a state of low fever creeps on, which is often accompanied by rigors, though these might at first be mistaken for the paroxysms of an intermittent, yet the perfect irregularity of their occurrence, and the absence of any distinct period of apyrexia, will soon induce us to relinquish any erroneous view we may have formed.

Prognosis.—Acute hepatitis is always a formidable disease; and if not early treated, is apt to go on to suppuration, and then very frequently terminates unfavourably. We have, however, reason to believe, from the appearances occasionally found in the liver after death, that abscesses have been insulated and absorbed; and we know that they are occasionally discharged by opening a way into the lungs or intestines, or through the parietes. The worst symptoms, and those which almost always portend a fatal result, are the long continuance of the febrile state, in

spite of our remedies ; and the occurrence of rigors in the more advanced periods, attended, as they usually are, by manifest failure in the powers of life ; the pulse becoming more and more accelerated ; the teeth loaded with sordes ; the countenance assuming a sallow and dingy aspect ; the lustre of the eyes fading : but, on the other hand, if active remedies have early produced an impression on the disease, and the symptoms have not returned with violence ; more particularly if the pulse becomes slower, and more round and full, and the tongue gradually cleaner, we have every reason to look for a favourable result.

Treatment.—The treatment of this disease should be marked by all the energy which destructive action, set up in one of the most important organs of the body, must necessarily demand.

Large general bleeding should be had recourse to, and repeated two or three times in the first twenty-four hours, if the symptoms do not abate ; at the same time, after clearing out the alimentary canal with one or two brisk calomel purges, a free action must be maintained on the bowels by the saline purgatives, and the arterial action lowered by diaphoretics, in which the liquor ant. pot. tart. should be combined as far as the irritability of the stomach will permit. Fomentations and poultices should be constantly applied to the right hypochondrium ; and when general bleeding has been carried as far as prudence will allow, if local pain should still be experienced, blood must be taken by cupping from the part.

Mercury has probably, in this affection, often been used to an injurious extent. In the early days of the attack we are quite justified in having recourse boldly to that combination of calomel, opium, and antimony, which has already been so much recommended as one of the most powerful means of overcoming inflammatory action, by checking in-

ordinate vascular commotion, and rendering the circulation through the system more equable; but in this disease there is a strong tendency to suppuration, and if we have not succeeded in arresting the inflammation in the commencement, we shall be in danger of doing mischief by persisting, for it is probable that the mercurial action promotes rather than retards the progress of suppuration.

When the disease is on its decline, blisters, and other means of counter-irritation, will prove of service; but for a long time it will be necessary, even after convalescence has been established, to pay the utmost attention to the state of the bowels, which are generally left in a most irritable or irregular condition after attacks of hepatitis. The diet must be mild and nutritious, and the residence must be such as is calculated to give tone and vigour, and by no means to relax the system, or by its dampness or its warmth to endanger a relapse.

When, during the progress of the disease, abscess has formed, and pointed externally, a very important question arises, as to the propriety of opening the abscess and discharging its contents. There can be no doubt, that it is desirable to get rid of the pus, but the practitioner should not be too hasty to interfere. The abscess in this case is of a peculiar kind; it is situated in a glandular organ of complicated texture, and in the beginning it is diffused in its character. If it be possible, it is better to wait till two important processes have taken place; first, the formation of a cyst to surround and insulate the abscess, and then, adhesion of the abscess to the parietes. If the cyst be not formed, there will be much more likelihood that the inflammatory action should be renewed and extended in the structure of the liver after the portion of pus already formed is withdrawn than there would be were the pus

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already circumscribed; and if adhesions are not formed between the abscess and the parietes of the abdomen, there will be great danger lest, some of the pus escaping, inflammatory action should be excited in the peritoneum.

SUPPURATION OF THE GALL-BLADDER OR LIVER, FROM
THE PRESENCE OF BILIARY CONCRETIONS.

It not unfrequently happens, that a person who, on various occasions during many years, has suffered from severe pain in the scrobiculus cordis and the right hypochondrium, with the occasional presence of more or less confirmed jaundice, is seized with an attack of a somewhat more inflammatory character, but still imperfectly marked, with a quick pulse, furred tongue, frequent vomiting, pain and tenderness in the region of the liver, more particularly in a single point where the gall-bladder may be supposed to be situated. The skin becomes gradually completely jaundiced; irregular rigors take place; the bowels are irritated; the sensorium much affected, first with wandering delirium, and afterwards with an approach to coma, which continues sometimes several days before death takes place.

On the examination of such cases after death, the gall-bladder has been found converted into an abscess filled with a mingled mass of pus and biliary calculus, in a crumbling paste-like form, or the biliary concretion has been found filling the ducts, and numerous abscesses have been discovered in the substance of the liver, while the branches of the vena portæ have been extensively inflamed and blocked up with fibrinous coagula mingled with a matter resembling pus.

Diagnosis.—The precise situation of the pain may lead to a strong suspicion that the gall-bladder is the part more

immediately implicated, but the general symptoms will vary so little from what might arise, were any other part of the liver inflamed and suppurating, that little more than a conjecture can be formed. When, however, there is a distinct account of repeated returns of jaundice, at distant times, attended by symptoms of the passing of calculi from the liver, such a cause is naturally suspected as being connected with the inflammatory and suppurative processes going on; and if, on the present occasion, jaundice be not a conspicuous symptom, the probability is increased that the gall-bladder itself is the seat of the disease.

The *prognosis* in such cases is always unfavourable, but if the patient's constitution should be unimpaired, the power of nature, aided by our art, is quite capable of repairing the mischief done, even in the gall-bladder; and our pathological inquiries lead us occasionally to discover a gall-bladder obliterated by former disease, or fixed by adhesion to a portion of intestine, through which both calculus and pus have been evacuated; and even an external abscess has been formed, by which the bile, the pus, and the calculus, have all been evacuated, and perfect recovery has followed.

Treatment.—The treatment in these cases will be little more than a modification of that which is necessary in the acute forms of hepatitis; it must be strictly antiphlogistic, and perhaps even actively directed to overcome inflammation in the first place, and afterwards we must allay irritation by sedatives, while the secretions are maintained and the health supported. The local application of the means of diminishing inflammation will also be required, and a great variety of palliative remedies, to meet the emergencies of sickness, diarrhoea, or prostration, which will necessarily arise in so important a disease.

SUBACUTE INFLAMMATION OF THE LIVER.

The liver is subject to another form of inflammation, which pervades the whole organ more generally than in the acute hepatitis, of which we have spoken, but is not marked by such severe symptoms. It frequently comes on very insidiously, with symptoms and feelings of general constitutional derangement, depression of spirits, slow pulse, oppressed breathing, wandering abdominal pains, constipated bowels, and sometimes sickness of stomach, and occasionally rigors or chills. In a day or two the conjunctiva becomes tinged, and in a few days more there is universal bright bilious suffusion of the skin. It is now found that the pulse is accelerated, but it is sometimes still oppressed; and frequently, on tolerably severe pressure about the region of the liver, some degree of tenderness is manifested, while in other cases, pressure produces little or no immediate suffering, but the pain comes on gradually a short time after the pressure has been made, and continues for hours or for days. Cases of the less acute kind generally yield readily to treatment, if it is adopted early, and they form a large proportion of the cases of simple jaundice which present themselves in practice. In other cases, the inflammatory action is attended with much more severe symptoms, with considerable pyrexia, quick pulse, flushed countenance and dry tongue, while a jaundice of the most intense colour is diffused over the whole surface. The stools are, both in the more and less acute cases, of a light colour, but less decidedly so, and subject to greater variations, than when jaundice has been caused by mechanical obstruction. The urine is deeply tinged. When the disease assumes a more active and febrile form, those symptoms referable to the brain and nervous system, and which appear partly to depend

on the deleterious effects of bile circulating in the blood, are very strongly marked, and a tendency to hæmorrhage is very early evinced.

Morbid Appearances.—The condition of the liver differs according to the period at which the disease has proved fatal; but in general, the size of the organ is not materially increased, though, on the contrary, it is not unfrequently perceptibly diminished. There is no accumulation of bile in the minute ducts; and the yellow tinge which pervades certain portions of the structure is scarcely more than other structures of the body have obtained from the bilious impregnation with which the blood is loaded, and bears no analogy to the dark green of the liver gorged with bile from obstruction of the large ducts. On examining the gall-bladder, it is found to contain little bile, and sometimes scarcely a trace of that fluid is to be discovered colouring the mucus accumulated by the secretion of its lining membrane. When the disease has terminated early in its course, the whole liver feels rather soft and flaccid, the surface appears variegated, of a light yellow and dark red or purple, in patches; and certain portions project above the rest, which, when cut through, sometimes prove of a softer texture, and even to be undergoing a process of change or disorganization; and portions of the same kind are intermixed throughout the whole substance of the liver; while, at other times, the yellow portions are harder than the surrounding substance. If the disease has not proved fatal at an early period, and while jaundice has been present in a brilliant or intense form, but has gone on for some weeks till the skin has assumed a light lemon-colour tint, which often bespeaks a very general disorganization of the liver, we find the structure extensively altered, and a great many of the acini altogether incapable of receiving such a quantity of blood as is necessary for the secretion

of bile, or for giving the healthy colour to the organ. They are then of a whitish-yellow colour, and rather hard and contracted than enlarged, and these altered acini are seen in groups and clusters which, on careful examination, will generally be found to follow the course of the divisions of the portal vessels, so as to be disposed around them like a sheath, which sometimes extends to the thickness of a quarter of an inch. Any decided marks of suppuration are rare, unless the disease have been complicated with causes of mechanical obstruction and irritation, as the previous deposit of biliary concretion in the ducts.

Exciting Causes.—The chief exciting cause is exposure to atmospheric changes, more particularly when the action of the bowels has been neglected. External violence and injuries will excite it, as probably the incautious use of mercury; and constipated bowels may act not only as a predisposing but as an exciting cause.

Diagnosis.—The great mark which distinguishes this form of inflammatory action, is the early appearance of jaundice, with symptoms of inflammation, often very slight, but sometimes more decided, particularly the accelerated pulse and furred tongue, while all evidence of the other ordinary causes of jaundice is wanting.

Prognosis.—In the more mild cases, where the inflammatory action is slight, the recovery is almost certain if the disease is treated early; but this is not the case in the more severe attacks; and as the urgent symptoms occasionally supervene upon the milder, the prognosis should be guarded. If, in a few days, it is found that symptoms remain mild, even though little obvious progress is made towards their removal, we may pretty confidently expect recovery. If, on the contrary, the pulse rise in frequency, become sharp or perhaps hard, the tongue assume a red colour, is dry and furred at the base, the jaundice become

very intense, and a drowsy condition take place, alternating with restlessness and occasional wandering of the intellects, the result of the case will be very doubtful; and should these symptoms increase, the prostration, and above all the cerebral depression and disturbance be augmented, the patient will fall into a state resembling low fever, with somewhat of a remitting character, and will in all probability sink.

Treatment.—Whether this disease be essentially inflammatory in its very early stages, or whether a state of congestion, in some portion of the hepatic structure, precedes to such a degree as to render it rather a congestive than an inflammatory disease, will admit of doubt; but before its character is so fully developed as to bring it under the eye of the practitioner, more or less of an inflammatory action is extensively spread through the liver, and our treatment must accordingly be decidedly antiphlogistic. It is only in the more severe cases, marked by considerable vascular excitement, a frequent pulse and some heat of skin, and tenderness on deep pressure, that general bleeding will be required. In the milder cases, cupping, or leeches to the margin of the ribs, will generally be useful, and in many cases quite necessary. In all cases, however slight, the patient should be kept strictly in bed, to favour the more equal distribution of blood on the surface of the body, and a dose of calomel and rhubarb, three grains of the one and fifteen or twenty of the other, should be at once administered, followed after a few hours by castor oil, or the senna and sulphate of magnesia if necessary. Combinations of mercury, antimony, and moderate purgatives are the remedies on which we are chiefly to rely; and for this purpose, two grains of antimonial powder, three of extract of colocynt, and two of blue pill; or the sixth of a grain of ant. potas. tart., with a grain of calomel and a little colocynt, may be given every

six hours; and should the bowels become irritable, the purgative portion of the pills may be omitted, and even a grain or two of the extract of poppy may be substituted, while the bowels are regulated by occasional doses of some simple purgative. If the skin does not become perspirable, doses of the liquor ammon. acetat. may be given three times a day, in the hours intervening between the pills; and the warm bath may be advantageously employed, a large linseed poultice being, during the whole time, kept applied to the right hypochondrium.

By these means, the tenderness of the liver will subside; the jaundice will gradually disappear; the urine become lighter coloured; the stools assume their healthy character; the tongue lose its fur; and the natural taste and appetite for food return: but all this may be an affair of several weeks; and if the means are used negligently or inefficiently, months, years, or the whole life may not suffice to restore the liver to its state of integrity.

CHRONIC HEPATITIS.

There is a still slower process of inflammation to which the liver is subject, one which affects the whole extent of the viscus, gradually rendering it unfit for the discharge of its functions, and reducing it to a state in which it greatly embarrasses the circulation, and gives rise to a succession of diseased actions, under which life is destroyed.

This slow disease is often overlooked for a considerable time, and is only recognised when the destruction of the liver has advanced so far as to give rise to some incurable condition of the system showing itself in confirmed jaundice, destructive hæmorrhage, or unconquerable dropsy. The symptoms are indeed, in the commencement, so obscure, that it is almost impossible to recognise them with certainty. They usually begin by slight indications of

dyspepsia, some wandering pains about the upper part of the abdomen, and some occasional sallow discolouration of the countenance. If careful observation is made, the bowels are found to be irregular, and the stools to be fœtid and ill-digested; while the urine is rather more scanty than usual, and frequently dark-coloured, or loaded with a red and sometimes with a pinkish sediment; and, if disease is suspected, a pretty decided tenderness may be discovered by moderate pressure in the right hypochondrium. After the lapse of many months, during which nothing but dyspepsia has been suspected, emaciation becomes evident, and the fixed though probably slight sallowness of the complexion and conjunctiva, excites the attention of the most casual observer: then, perhaps, is it first seriously suspected that the liver is the seat of chronic inflammation, and medical advice is sought; but by this time the disease has made great progress, it has long possessed itself of the organ, the structure of which is already changed. The attention having been now led to the right channel, the symptoms are at once perceived to be most marked and unequivocal: the sallow, shrunk countenance; the yellow conjunctiva; the unhealthy and flaccid state of the skin over the whole body; the red tongue; the lost appetite; the occasional feeling of loathing and nausea; the obscure wandering and variable pains in the abdomen; the uneasy tenderness on pressure more particularly in the right hypochondrium; the unhealthy yellow or black stools; the loaded urine, of a yellowish tinge, often staining the vessel of a bright pink or lake colour; all bespeak the nature of the mischief which had been long overlooked or only fearfully suspected by the patient or the practitioner. It is now soon found, that towards the evening the ankles begin to swell; an unaccustomed feeling of weight is experienced in the abdomen; flatulent distention is more

spoken of; the patient complains that purgatives do not act so freely, or at all events do not give such relief, or empty the bowels so completely, as they formerly did: on examining the abdomen very carefully, there is reason to suspect effusion of serum into the cavity of the peritoneum, and in a few days or weeks there can be no doubt remaining, that a decided fluctuation is yielded by percussion. This increases with various degrees of rapidity, till the patient sinks under the symptoms of confirmed *ascites*; at other times, the same tendency to effusion may show itself in other parts; and the chest may, in like manner, be occupied by serum, recognised by all the symptoms of *hydrothorax*.

It not unfrequently happens, that before any symptoms of dropsical effusion have been perceived, another set of symptoms has preceded, marking the tendency to hæmorrhage, more particularly from the stomach and bowels. The patient has been observed to become gradually paler and weaker; his lips have lost their colour; and his conjunctiva, still tinged with yellow, presents a glassy transparency: and all this without any known cause, till, on inspecting the evacuations from the bowels, they are found to be of a pitchy blackness, sometimes of an intense brown colour, sometimes tinged with red; in short, it appears that the feculent matter is mixed with a large proportion of blood, which passes off constantly in this altered state, having undergone changes in its passage through a longer or shorter portion of the intestines. At other times, the hæmorrhagic tendency has shown itself by profuse and often-repeated attacks of *hæmatemesis*; the patient ejecting daily, by vomiting, large quantities of a grumous fluid, or of blood unchanged by the action of the stomach. Sometimes again, the prominent symptoms are those which accompany the undue circulation of the bile with the blood;

jaundice has become well marked or even intense; and the depression of body and mind consequent upon this state, has given a character to the latter stages of the disease. Sometimes all these forms of disease have developed themselves together or in succession, sometimes the patient has sunk under some one which has become more prominent than the rest.

Morbid Appearances.—On opening the abdomen, more or less fluid is generally found effused into the peritoneum, and, in all probability, marks of repeated general or partial peritoneal inflammation are distinctly to be traced; sometimes the whole intestines are covered with an opaque but thin false membrane; sometimes portions of the peritoneum are mottled with black, apparently carbonaceous deposit, the result of small effusions of blood; but the essential disease is found in the *liver*. This organ is probably not at all larger than natural; it is more frequently diminished in its size, and is scarcely seen projecting below the margin of the ribs, and when drawn into view scarcely resembles in the most distant way the natural viscus. Its surface is quite uneven, either marked by lobulated projections, or thrown into innumerable elevations, separated by corresponding depressions, while the peritoneum is thickened, semi-opaque and glistening; so that the whole looks not unlike a wet bladder stretched tightly over a quantity of dark-coloured peas or beans, and when felt by the hand its firm consistence would scarcely diminish the resemblance. When an incision is made, the resistance afforded to the scalpel is considerable, and in some advanced cases approaches to that of cartilage. The same structure which could be traced on the surface is apparent in the section, for, throughout the liver, small rounded portions of the organ, retaining some indistinct traces of the natural gland, are seen, surrounded by a firm membranous structure,

which sometimes is only in sufficient quantity to form thin cysts or cavities for the reception of the rounded masses, and from which they can be removed without difficulty by the handle of the scalpel; but at other times it forms a large proportion of the whole liver. The rounded masses are the only remaining parts of the organ which admit of secretion, and appear to be small parcels or subdivisions of the glandular structure, drawn together and compressed by the thickening and contraction of the cellular membrane which pervades the organ; for a time the bile secreted escapes, and the liver retains something of its natural colour, but frequently the ducts are obstructed and more or less of a yellow tinge is imparted to the acini.

Other organs may be found diseased, and amongst these most frequently the stomach; the mucous membrane of which will be often diseased, thickened, rough, and scabrous; sometimes irregularly injected with blood, at other times of an unnatural paleness.

Exciting Causes.—The chief exciting cause of this condition of chronic inflammation in the liver, is the excessive use of ardent spirits and fermented liquors; probably other stimulating substances applied habitually to the stomach, as food or condiment, will ultimately produce the same effect, and it is reasonable to believe that the congestion or irritation produced in the liver by exposure to suppressed perspiration and the irregular action of the skin and kidneys, which occur in the laborious avocations of life, or the residence in tropical climates, may assist or may predispose to this chronic inflammation.

Diagnosis.—The commencement of this disease is usually so mixed up with symptoms of dyspepsia, that it is almost impossible to foresee, at the very beginning, the result which is about to take place, except by a knowledge of the habits of the individual: but a certain degree of ful-

ness in the region of the liver; some tenderness on pressure; a casual slight jaundice; a red tongue; great irregularity of bowels, with unhealthy secretions; ought to give early information of the slow inflammatory action which is going on; and at all events, after a time, the obstinacy of the symptoms will excite or confirm our suspicions; and then we shall begin distinctly to distinguish the dull pain extending towards the right hypochondrium from the gastrodynia and griping which attend dyspepsia: we perceive the sallow, the obscure, the muddy cast of the complexion, the decidedly declining strength, the more permanently depressed spirits; and our diagnosis is more confirmed; and when the dropsical symptoms have shown themselves, or hæmatemesis has taken place, we become certain, though unfortunately too late, of the change which has taken place. At this time, likewise, we may sometimes by the touch ascertain the rough feel of the small portion of the liver which projects below the ribs.

It is not necessary in this place to point out the distinctive marks which would lead us to ascribe the *hæmatemesis*, the *jaundice*, or the *dropsy*, to other sources of disease; it is sufficient here to mark their connection with the chronic inflammation of the liver: for the rest, opportunities will arise hereafter.

Prognosis.—This depends entirely on the period at which the disease becomes the object of treatment, and the influence which the practitioner can obtain over the mind of the patient, to induce him to relinquish those habits of indulgence or exposure from which the disease has arisen, and by which it will infallibly be kept up and increased in spite of all remedial means. If taken early, the prognosis is favourable with the assistance of the patient; but if the sallow complexion has been already attended with progressive emaciation; if the jaundice has become permanent; if

dropsical effusion has begun; if hæmorrhage has shown itself from the bowels or the stomach; or if the bowels have been obstinately irritable; our prognosis is always unfavourable; and in proportion as a greater number of these unfavourable circumstances have occurred, or each has gone to a greater extent, is the hope of cure or permanent relief diminished.

Treatment.—The first step towards cure is to remove the exciting cause: in the present case this is not a casual or transitory cause, but is fixed in the habits of the patient; and if not removed will be more powerful than any remedies we can oppose to its effects. The greatest temperance must be inculcated, and the mildest diet must be insisted upon. All faulty circumstances, either in the quantity, quality, or times of taking food, must be immediately corrected. The bowels must be carefully regulated; mercury must be cautiously administered in small and alterative doses not capable of producing excitement in the liver, but still capable of moderating action, and perhaps of exciting some degree of absorption, if the cellular membrane should already have begun to undergo its injurious change; for these purposes, doses of a single grain of blue pill, or two grains of the pilul. hydrarg. chlorid. compos., every night, may for a certain time be given; and half an ounce of the compound decoction of aloes, with a drachm or more of tincture of senna, according to the effects produced, may be given every morning. At the same time, some light, bitter infusion, as of the orange-peel, the gentian, the rhubarb, or the camomile, should be administered with some alkaline remedy, either the liquor potass. in doses of fifteen minims, or five grains of the sesquicarbonate of ammonia; sometimes, however, the alkalies are found less efficient than the mineral acids, and then we may substitute three or four minims of the hydrochloric

acid, and half a drachm of the tincture of hop, with a little syrup, three times a day, instead of the alkali; or two minims of the nitric acid may be added to two of the hydrochloric acid for a dose. Various combinations of the bitters and the mineral acids will be found useful, but we must in such cases be cautious in the use of any preparation of mercury; indeed, during the administration of the mineral acids, the mercury had better be entirely relinquished, as the bowels are apt to be irritated in spite of any precautions we may take. In this disease, where the stomach and liver are generally both involved, and where total change in all the previous habits is the best security, we frequently see the full advantage derived from the use of the gently purgative mineral waters, taken at their springs with all their accompaniments of air and exercise, and carefully-regulated diet and cheerful social intercourse; and waters which, like some of those of Cheltenham, combine a moderate infusion of the chalybeate with their saline ingredients, are particularly advisable.

Unfortunately, however, a large proportion of those affected with chronic inflammation of the liver are altogether unable to take advantage of means such as these; and another very large proportion are unwilling to leave for a sufficient length of time their occupations or their amusements, as long as they have the slightest hope of retaining them, and thus lose the opportunity of cure, which early care might have afforded. In such cases nothing remains for the physician but to palliate and relieve; and in chronic disease affecting this very important organ, circumstances are continually arising which require almost endless modifications of treatment, into the minutiae of which it would not be possible to enter in an elementary work: but throughout, and under every change, it must be a great object to allay irritation, and to reinstate as far as possible in their healthy functions those organs which have suffered. The

extract of conium, the hyoscyamus either in extract or in tincture, and the hop, are all very applicable as allaying irritation without constipating the bowels; and the extract of poppy will be very useful in the same way when the bowels are inclined to be relaxed; the more decided opiates are generally objectionable. When the stomach shows great evidence of irritability, the hydrocyanic acid in doses of two minims of Scheele's strength, with a little carbonate of soda and some stimulating water, may be prescribed; or effervescing draughts, with ammonia or with magnesia. Should the urine become very scanty, the vegetable diuretics, in decoction, infusion, and tincture, with carbonate or acetate of potash, will often act well; and taraxacum, in its various forms, has been much used, to all of which the nitric æther, and the ammonia, are often added with much advantage in the broken constitutions we have to treat.

As external applications, cupping and leeches are occasionally called for when tenderness and pain are experienced; and blisters, and warm plasters either of a mercurial character or not, appear to give relief to internal uneasiness, if they do not essentially promote cure; the external use of a bath for the feet or hands, impregnated with the nitro-hydrochloric acid, has been much praised. Thus by the most careful and varied management we may hope to retard, and, if seen very early, even to remove the chronic inflammation of the liver, and all its various consequences: but more frequently the result is otherwise; the disease is already too confirmed for cure; and the patient will obstinately or involuntarily continue in his bad habits, or at most will but inefficiently modify them; and we are called upon to sustain life for a few years or months, amidst all the miseries of general *dropsy*, or of chronic *jaundice*, or to see the remaining powers of the system gradually exhausted by successive attacks of *hæmorrhage*.

SPLENITIS.

The SPLEEN, in common with the other organs of the body, is subject to inflammation, and, as in the case of the liver, the inflammation may attack either the peritoneal covering of the viscus or its substance. Judging from the appearances which often show themselves after death, we should be led to infer that the former was by no means uncommon in a more or less active form, while the acute inflammation of the organ itself is, in this climate, probably of rare occurrence.

INFLAMMATION OF THE PERITONEAL COVERING OF
THE SPLEEN.

The symptoms accompanying inflammation of this portion of the peritoneum differ chiefly from those which attend the membranous inflammation of the liver, in the situation of the pain and tenderness on pressure, which, in this case, are of course confined to the left hypochondrium. The same chills and rigors, with quickened, hard, and frequently small pulse, and white tongue, will occur, and the diaphragm and stomach will both participate; so that occasional sickness and some degree of diaphragmatic convulsion, and possibly of palpitation of the heart, will be present.

Morbid Appearances. The peritoneum covering the spleen presents all the usual results of inflamed serous membranes, varying according to the period and the character of the inflammation. In the earlier periods, vascularity in various degrees, and sometimes ecchymosis, occurs, and in the more advanced stages, adhesions take place to the surrounding viscera: when the inflammation has assumed a less active character, the spleen is found covered with a fibrinous coat, or with considerable cartilaginous or even

bony deposits; and where the tubercular diathesis prevails, the deposit on the surface of the spleen assumes that peculiar character.

The causes as well as the treatment of this local peritoneal affection, differ very little from those which have been described in connection with inflammation of the peritoneum of the liver; and the diagnosis turns in a great degree upon the situation of the pain and the influence of the diaphragm in increasing it, while the stethoscopic signs of pleuritis or pericarditis are absent.

INFLAMMATION OF THE SUBSTANCE OF THE SPLEEN.

When acute inflammation takes place in this organ, it is accompanied by symptoms of general pyrexia, and the usual symptoms of inflammation, with a reference of pain, more or less acute, to the left hypochondriac region. It is also occasionally marked by great disturbance of the heart's action, with spasm of the diaphragm and sickness; and a peculiar sallowness of complexion is apt to come on in the more advanced stages of the disease, when the lower extremities often show an inclination to œdematous enlargement. If the disease be not checked by chills and rigors succeed, and all the symptoms indicate important internal suppuration, under which the patient gradually sinks; or such slow and imperfect restoration follows, marked by feebleness and anæmia, that there is reason to believe some permanent change has taken place in the structure of the organ.

The *Morbid Appearances* in this organ are often equivocal; for, owing to its peculiar structure, and to the varying quantities of blood which it contains, no viscus is more liable to changes of colour and consistence where no symptoms have existed to excite a fear lest inflammation should

have been set up, and when, even after death, no such symptoms can be referred to. When, however, we discover the structure of the spleen unusually soft and friable, and when we perceive it of a light reddish or lilac colour, we are perhaps not wrong in suspecting that inflammatory action has been going on; at other times, the inflammation having subsided, we find the organ hardened and fleshy, and considerably enlarged; and when less fortunate terminations have ensued, we find abscesses filled with a more or less unhealthy pus, generally mingled with blood; sometimes the abscesses assume a gangrenous aspect, and sometimes they form communication with the large end of the stomach, or with the colon, or some other viscus, or burst into the abdominal cavity; occasionally we discover traces of abscesses in the structure of the spleen, which seem to have contracted and formed cicatrices. It is not uncommon to find in connection with the inflammation and suppuration of this organ, that coagula have formed in various veins, either those belonging to the viscera or to the extremities; such coagula undergo changes and assume some variety of appearance, sometimes containing a large proportion of red particles, sometimes forming yellow fibrinous masses, and sometimes passing, in their centres, into a state of softening resembling suppuration.

The *Exciting* causes of splenitis are, injuries from blows or falls; alternations of heat and cold, especially after great exercise; febrile complaints, particularly of the intermittent and remittent character; and the application of certain miasmata to the body, such as are yielded by marshy districts under circumstances of intense heat, or great diurnal variations of temperature.

Diagnosis.—Splenitis may be confounded with pleuritis; pericarditis; the neuralgia accompanying hysteria

and chlorosis; with the peculiar pain preceding and following herpes zoster; or with the affections of the kidneys and of the colon. It will not, however, be necessary to recapitulate all the peculiarities of the symptoms attending on each of these diseases; but it is sufficient to say that the complications which arise sometimes completely conceal the existence of splenitis, and this is still more likely to be the case from the comparative rarity of the disease. When Splenitis is accompanied by distinct evidence of inflammatory action, it will readily be distinguished from some of the foregoing diseases by the excited pulse and general febrile state which attend it. The stethoscopic indications of pleuritis and pericarditis will of course be absent in splenitis; but percussion may afford important information, although it is chiefly in the *chronic* enlargements of the organ that this mode of diagnosis is applicable, and of these we shall have another opportunity of speaking. Should tumor develop itself in the situation of the chief tenderness, the spleen may be recognised, and the peculiar complexion will often bespeak disease of that organ.

Prognosis.—This is generally favourable; but when the symptoms run so high as to show the probability of suppuration having taken place, the result must be precarious.

The *Treatment* must be conducted on the general principles by which we are regulated in the treatment of inflammation of internal organs in general; free bleeding in the beginning, followed by cupping or leeches, blisters and fomentations; active purging and diaphoresis; and perhaps a somewhat more cautious use of mercurials than in cases of membranous inflammation; indeed as the disease goes on, we shall often find such unusual marks of debility accompanying it, as will lead us to husband the strength, and to support the system by gentle means; and as inflammation gradually subsides we shall be early called

upon to administer tonic remedies, beginning with the simple bitter infusions, and going on cautiously to quinine and the milder preparation of steel.

NEPHRITIS, OR INFLAMMATION OF THE KIDNEY.

Inflammation of one or both kidneys, as a purely idiopathic disease, is less frequently met with than most of the other phlegmasiæ, but is of frequent occurrence as an effect of certain acrid substances taken into the stomach, and of calculous matter formed and lodged in the interior of the organ. The disease may attack a single kidney, or it may affect both at the same time, whilst the symptoms in either case are observed to vary considerably, according to the nature of the exciting cause; and the original seat of the inflammation,—inflammation of the capsule of the kidney, being attended with more severe and painful symptoms than when the parenchymatous or secerning portion of the organ is originally affected. In its idiopathic form it has been observed to be preceded by chilliness or shivering, and is characterised in general by a deep-seated, severe and sickening pain in one or both loins: this pain is aggravated by pressure made over the region of the kidney, by the descent of the diaphragm, and by any considerable agitation or exertion of the body; it not unfrequently extends down in the direction of the ureter to the bladder, to the testicle, and occasionally even to the groin and thigh of the side affected, and is often attended with a numbness or tingling of the thigh, and painful retraction of the testicle; the urine is scanty, and at first perhaps pale, soon however becoming red, with repeated but sometimes unavailing efforts to void it, whilst in other cases the secretion would appear to be almost entirely suppressed;

the patient generally lies upon his back, and experiences a sense of great anxiety and weakness; the thirst is considerable, with nausea, flatulence, eructation, or even vomiting; the pulse is frequent, and the skin hot, sometimes dry, at other times perspiring, the perspiration in cases attended with complete suppression having, it is said, been observed to emit an urinous smell. In the progress of such a case, it occasionally happens that, sooner or later, the patient becomes affected with symptoms indicative of oppression or irritation of the brain; he begins to experience a remarkable sense of languor, drowsiness, and sluggishness of manner and intellect, symptoms which quickly pass into a state of coma, from which, nevertheless, he can be roused for a moment by loudly addressing, or by agitating him; the coma however increases, and is attended with a peculiar hissing noise in respiration, but chiefly during the act of inspiration, the face becomes pale, the pulse either continues nearly natural, or it is rather slow and unsteady, except towards the close, when it may be considerably accelerated, the general surface turns cold, and the cerebral oppression gradually increasing, the patient at length expires.

If we are justified in regarding a highly-congested, reddened, and somewhat softened condition of the secreting portion of the kidneys as a proof of inflammation, we know that with such a condition of these organs, the ordinary general and local symptoms are occasionally exceedingly slight, the earliest and almost the only obvious indication of its presence being, in some instances at least, a well-marked disturbance of the brain. This cerebral disturbance may assume either the character above described, that of a sudden attack of convulsion, or of quiet stupor, as will be more particularly noticed when treating of the diseases of the kidneys connected with dropsy. In such

cases the secretion of urine is not by any means in every instance totally suppressed.

By far the most frequent and painful, though perhaps not the most dangerous, forms of nephritis, are those connected with, and occasioned by, the formation and lodgement of calculous matter in the interior of the organ. Such patients are generally ascertained on inquiry, to have previously suffered more or less from symptoms of gravel, such as attacks of sickness or vomiting, uneasiness, weight, or pain in the loins, pain in the course of the ureter, and some modification of dysury; but whether preceded by such symptoms or not, it commonly happens that the patient is seized with an acute, pungent, tearing, or lacerating pain, and sense of heat in the region of one or both kidneys; this pain often comes on suddenly, and sometimes as suddenly disappears; whilst it continues, it is nearly at all times severe, and in some instances so excruciating, as almost to throw the patient into convulsions; it is the form of nephritis most commonly attended with a sympathetic affection of the ureter, testicle, or thigh of the side affected; there is frequent and difficult micturition, the urine being scanty, high-coloured, and in general sooner or later mixed with blood or sandy matter, or both, and in some instances, especially at a later period, with pus, or pus and mucus; in such cases, the secretion of urine sometimes appears suddenly to stop, and after a time as suddenly to reappear, without any serious consequence to the brain; although, in some less fortunate cases, with or without suppression, but generally the former, symptoms of oppression of the brain take place, and the patient dies comatose: there is frequently nausea, with flatulence, cructation, or even obstinate bilious vomiting; a remarkable feeling of anxiety and distress; an irregular development of hectic fever, the patient being liable to chills, succeeded either by a hot

and dry skin, or during the extremity of the pain by profuse or partial sweats; the pulse is accelerated and hard or contracted; the thirst is considerable, and the breathing hurried; in short, we have a combination of the symptoms of nephralgia with those of nephritis, the two sets of symptoms varying in preponderance and degree in different cases.

Acute nephritis may terminate in *resolution*; it may terminate in *adhesion* to the neighbouring parts; or it may terminate in or lead to *suppuration* and destruction of a greater or less portion of the tissue of the kidney. When suppuration takes place, the pain is in some instances observed to change its character, and from being acute or pungent, becomes of a dull character, and attended with a sense of weight in the loins; together with a change in the character of the pain, the pulse usually becomes softer and fuller, and the patient now and then experiences rigors, or irregular symptoms of hectic fever. When abscess forms in the kidney, the pus most frequently escapes down the ureter, and is discharged along with the urine; it may nevertheless, in consequence of adhesion taking place between the kidney and the neighbouring parts, be discharged into the colon, into the duodenum, or even into the thorax; the abscess may also burst into the general cavity of the abdomen, or into the cellular tissue of the loins. *Gangrene*, as a consequence of nephritis, is of extremely rare occurrence.

A very frequent termination of an attack of acute nephritis is in the *Chronic* form of the complaint; and especially when it happens to be connected with the formation of calculous matter; but whether the disease assume a chronic character from the very commencement, which is by no means uncommon, or whether the chronic result from an originally acute attack, the symptoms differ rather

in degree than in kind, from those already described: the local symptoms are for the most part less severe; the febrile excitement is either altogether absent or it is only occasional, or it assumes an irregularly hectic form, and there is less liability to disturbance of the brain; whilst the changes observable in the urine are in general much more decided and strongly marked, that secretion being not only cloudy from the presence of mucus, but thick and opake, depositing pus, or of a dark brownish or reddish colour, and containing coagula of blood or particles of sand, or an admixture of both.

Morbid Appearances.—The appearances discovered after death vary according to the nature of the cause giving rise to the disease, and according to the period of the disease at which death takes place. In cases of what may be called idiopathic nephritis, the kidney has been found somewhat enlarged, of a more or less deep red or chocolate colour throughout its whole substance, and with its general tissue softer and more lacerable than natural; in such cases too, on dividing the organ longitudinally from the convexity to the concavity, we have observed a more than usual quantity of opake mucus to ooze from the funnel-shaped bodies. In other cases of the kind, suppuration has taken place, either causing the formation of one or more abscesses in the substance of the kidney, or, in extreme cases, converting the entire organ into a mere bag or cyst, containing a variable quantity of pus. Such suppurative disease, however, occurring independently of calculous or scrofulous deposit, is most frequently met with, in cases of nephritis, connected with some obstruction to the discharge of urine from the bladder, as happens in stricture and diseased prostate. In a large majority of instances, we find these morbid appearances blended with manifest indications of calculous or scrofulous deposit; there may be calculi lodged

in the ureter, in the pelvis of the kidney, or in various parts of its substance; these calculi may be grasped, as it were, by the tissue of the kidney, or they may be contained in a suppurating cavity and surrounded with purulent matter, or, as already stated, in extreme cases the kidney may be entirely destroyed. In other cases, instead of calculi we find depositions of tubercular or scrofulous matter in one or more parts of the substance of the kidney; we find these in different stages of softening and suppuration, and apparently, in some instances, causing, like the calculi, more or less extensive destruction of the organ. With a greater or less number of the morbid appearances mentioned, the kidney may be enlarged or dilated, or it shall be remarkably small and shrunk; its tunic, as well as the surrounding cellular tissue and capsulæ renales, may be thickened or indurated, or adhesion may have taken place between the inflamed organ and the parts adjacent; we may find that an abscess has burst into the cellular tissue of the loins; that matter may be making its way externally, or that it has been discharged into the colon, or some other neighbouring viscus. With these appearances of the kidneys themselves and parts adjacent, we very commonly find the coats of the bladder thickened, the organ contracted in size, and its mucous lining variously diseased. When nephritis has ended in great disturbance of the brain, with coma, an effusion beneath the arachnoid and into the ventricles, has occasionally been met with after death, the fluid so effused having sometimes at least afforded urea on being subjected to chemical analysis; we have seen cases nevertheless terminating in this way, in which no effusion whatever was discovered on dissection.

Causes.—Nephritis most frequently occurs in the dyspeptic and gouty, and in persons of sedentary and luxurious habits, or, which is much the same thing, in those who are

prone to calculous, or gravel complaints in general. It is most liable to make its attack about or a little beyond the middle period of life; but in the highly serofulous it is perhaps most common to find it making its attack from a very early period of life to the age of 25 or 30; it has also been observed to prevail more in certain districts than in others. As regards the exciting causes, like the other phlegmasiæ, it may be produced by general or partial exposure to cold and damp; it may be produced by mechanical violence, such as blows, falls, strains, violent exertion, long-continued travelling in a carriage or on horseback; it may be a consequence of inflammation extending to the kidney from a neighbouring part; it may be excited by cantharides, turpentine, savine, or copaiba, taken into the stomach; it may occur in connexion with the irregular forms of gout; apparently, it may be excited by the mere aerimony of the urine, occasioned by a congested or obstructed liver; or, what is infinitely more common, it may be occasioned by calculous or serofulous matter deposited in the kidneys, by fungoid or other disease of the organ, or by obstruction to the discharge of the urine from the bladder, as observed in stricture, enlarged prostate, and various diseases affecting the bladder itself.

Diagnosis.—In every case of suspected nephritis, the student ought to make it his first business to ascertain whether the patient has received any mechanical injury; whether he has taken any article of diet or medicine which could possibly have given rise to the disorder; or whether he has had a blister applied to any part of the body.

When the usual local symptoms of nephritis are slight or inappreciable, and when, notwithstanding the brain manifests more or less of the disorder usually observed to result from interruption to the renal secretion, as is now and then the case, the diagnosis cannot but be difficult, and will

perhaps at all times be more or less doubtful. Under such circumstances, if the previous history of the patient afford us no assistance, we must be guided chiefly by negative indications, and by the type or character of the cerebral disturbance. When, without any obvious cause, a person becomes sluggish and somewhat torpid in his manner; when he displays a sort of drowsy inattention to objects and persons around him; when he requires to be roused before he can clearly comprehend a reply to questions; or when, in more aggravated cases, he becomes more or less comatose, probably with a natural or quiet pulse, a pale countenance and cool skin; or when, with such symptoms of complete coma, we have a peculiar sort of stertor, characterized rather by a hissing than by a rough and guttural sound during both inspiration and expiration; in short, symptoms bearing some resemblance to those of reputed serous apoplexy;—we ought at all times to suspect an inflammatory condition of the kidneys, and inquire carefully into the state of the urinary secretion, which, if the case be one of nephritis, will generally be found to be exceedingly scanty, if not entirely suppressed. Of course the diagnosis would be further strengthened if we ascertained that the patient had been more or less affected with nausea or vomiting, with frequent or difficult micturition, with pain or other uneasiness in the loins; if he has suffered from stricture or diseased prostate; or if the urine, on examination, is found to be coagulable by heat, or mixed with sand or red particles. As the cerebral symptoms most probably result from the mere interruption to the seccrning power of the kidney, it is of paramount importance, in every such case, to ascertain if possible whether such interruption may not be owing to chronic mottling of the organ, or some other cause altogether independent of actual inflammation; a precaution the more necessary, as, in the insidious form of nephritis under

consideration, both the general and local symptoms are apt to be comparatively slight. The more ordinary forms of nephritis may be mistaken for colic, lumbago, lumbar abscess, enteritis, gastritis, and disease of the bladder.

Nephritis is to be distinguished from *colic* by the history of the case ; by the pain being deep-seated in the loins or in the course of the ureter ; by the pain or numbness of the thigh ; by the frequent or painful micturition ; by the appearance of the urine ; and by the pain not being materially or uniformly relieved by a free discharge from the bowels. Nephritis is to be distinguished from *lumbago* by the circumstances just enumerated, and by the pain in the loins not being so uniformly nor so exquisitely aggravated by moving the body from the bent to the upright position, as in lumbago. With the absence of the ordinary symptoms of nephritis, *lumbar abscess* may be suspected from the strumous aspect of the patient ; the more dull and obscure character of the pain ; the paleness of the countenance ; and a more or less perfect development of hectic fever. It is chiefly the calculous forms of nephritis that are liable to be mistaken for enteritis and gastritis ; for it is in such cases that the pain complained of by the patient is often very ill defined, and is attended with considerable uneasiness and flatulence of the stomach and bowels, and often with nausea or repeated attacks of violent bilious vomiting ; so that without great caution and a careful investigation, the mistake may readily be made. This caution and vigilance must appear still more indispensable, when it is recollected that distressing cructations, nausea, or even violent attacks of vomiting, are not unfrequently occasioned by calculus in the kidney, when the local symptoms are so extremely slight as to pass unobserved either by the patient or the practitioner. Such calculous cases, too, when unattended by pain, may be supposed, from the presence of nausea and vomiting, to

depend upon disease of the brain ; or, when accompanied by pain, may be mistaken for gall-stones, for hysterical or spasmodic pain, or organic disease in some part of the intestinal tube, or for an ulcer in the stomach. Bearing in mind these various sources of fallacy, a correct diagnosis may in general be arrived at with considerable confidence.

When the disease is connected with a scrofulous deposit in the kidneys, it may occasionally be recognized by inquiring into the history of the patient's family ; by his scrofulous aspect ; by a dull pain in the region of one or both kidneys ; by some of the pains or sensations already described ; by the frequent micturition ; by the occasional appearance of blood in the urine ; and, at a later period, by symptoms of hectic, and by a discharge of pus.

There can be little doubt, that, in consequence of the irritation to which it is subjected from the morbid quality of the urine, the bladder, sooner or later, and often at an early period, affords sufficient evidence of being also in a diseased condition ; a circumstance which, in some instances, renders it extremely difficult to determine whether disease has originally affected the kidney or the bladder. This difficulty, however, principally occurs in cases of scrofulous disease of the kidney ; in which, as in other scrofulous affections, the local symptoms are often extremely slight in the first instance. By attentively watching the progress of the case, the difficulty will in general be overcome, and especially so, if, by a careful exploration of the bladder, the surgeon can detect no change in the physical condition of the organ. It is nevertheless true, that in spite of every caution, original disease of the kidney may be mistaken for original disease of the bladder, and *vice versâ* ; whilst both diseases, in their progress, not unfrequently give rise to each other.

TESTS OF THE PRESENCE OF BLOOD, PUS, OR MUCUS IN
THE URINE.

When blood is present in the urine, the latter becomes tinted of various hues from very deep amber, to brown, deep green, or black. The only substance, the presence of which is likely to occasion any confusion in our diagnosis, is the colouring matter of bile. The addition of a little nitric acid to some of the urine contained in a white shallow vessel, as a plate or saucer, will at once remove any difficulty that may previously have existed, as this re-agent does not materially affect the colour of urine containing blood, whilst it causes bilious urine to assume a green tint, rapidly becoming violet, and ultimately red. Sometimes the hæmatosine or colouring matter of the blood is separated, and found forming a deposit at the bottom of the vessel, of a reddish or brownish colour, whilst the serum of the blood from whence it was derived, remains mixed with the urine, but without imparting to it any adventitious tint: in this case, on decanting the supernatant urine, and adding to it nitric acid, a turbidity ensues from the coagulation of albumen, which will at once determine the sanguineous origin of the coloured deposit: the chemical characters too, of the latter,—its insolubility in boiling water and dilute nitric acid,—will serve to distinguish it from all other coloured deposits.

Pus and mucus, when present in the urine, are always either colourless or only faintly yellow, provided no blood is present. These fluids, when diffused in urine, so closely resemble, in their physical characters, the earthy phosphates which are often found suspended in *ropy* mucous or pus-like masses in the urine, that they are constantly mistaken for each other. To remove any doubt on this subject, some nitric acid should be added to the fluid, and the mixture well agitated; if the troubling depended upon

the earthy phosphates, it will altogether disappear, these salts being readily soluble in strong acids; whereas the troubling will be increased if it depended on pus or mucus.

If the deposit consists of mucus, the urine is almost always *alkaline*, never acid, sometimes neutral, *not coagulable by heat*; the deposit itself does not form a transparent jelly by agitation with a solution of potass. If the deposit is really purulent, the urine is generally if not always *acid*, *always coagulable by heat* and nitric acid, from the presence of free albumen; the deposit itself, by agitation with a solution of potass or common salt, becoming converted into a transparent, gelatinous mass.

Prognosis.—The prognosis is to be drawn from a due consideration of the particular form of the complaint, the nature of the cause producing it, the character and urgency of the symptoms, and the age and constitution of the patient. The least alarming often proves the most dangerous form of the disorder; and hence, when it makes its approach insidiously, with little or perhaps no local pain whatever, but with symptoms of oppression of the brain, it is at all times attended with extreme danger, and will for the most part be found to prove fatal; and, indeed, whatever may be the form of the complaint, provided the brain become involved, the most serious apprehensions ought at all times to be entertained as to the result, especially if the secretion of urine be not only diminished but altogether suppressed. In the more ordinary cases, attended with obvious local symptoms, but without indications of calculous or scrofulous deposit in the kidneys, provided the patient be not very old, nor of very infirm or cachectic habit of body, and provided we are called early, and there exist no indications of oppression of the brain, the prognosis is for the most part favourable, such cases pretty uniformly yielding to the judicious application of active and appropriate remedies. When the

disease arises from aerid urine, or from a tendency to the formation and deposition of calculous matter, the prognosis is upon the whole favourable, since, by proper medicines and a due regulation of the diet and regimen, we can generally succeed in greatly mitigating the disordered function of the kidney, if not in entirely removing it; but when we have reason to apprehend that calculous matter has actually lodged and fixed itself in some part of the kidney or its appendages, our prognosis must have reference not only to the immediate danger of the patient, but to his ultimate and complete recovery. In regard to his immediate danger, unless worn out by a long protracted disease, by incessant or repeated vomiting, or by lingering hectic, however acute may be the pain, it seldom happens that the complaint proves an immediate cause of death, unless, indeed, symptoms of cerebral disturbance happen to supervene, which is by no means very uncommon. It is possible, nevertheless, without the supervention of cerebral symptoms, that acute suffering, long protracted, may sink the powers of life, and the patient die, and especially so if obstinate vomiting prevail, or the disease have proceeded to suppuration and consequent destruction of the kidney. As regards the ultimate and complete recovery of the patient in calculous cases, the prognosis is much more equivocal, as such persons are extremely liable, from the slightest causes, to experience repeated relapses of irritation and inflammation, and this for many years, or perhaps during the whole of the remainder of life: the frequency as well as the violence of the relapses, however, depending very much upon the medical care of the patient, and his observance of a regulated diet and regimen. When, from the youth and general aspect of the patient, the character and progress of the symptoms, and the appearance of the urine, we have reason to conclude that the disease results from scrofulous or tu-

bereular deposit in the kidneys, our prognosis is at all times bad, inasmuch as, however long protracted, the disease very generally proves fatal in the end : whilst cases are still more hopeless, in which, from the history and appearance of the patient, from the local symptoms, or probably from some manifest enlargement of the organ, we have reason to believe in the existence of malignant, fungoid, or cystiform disease of the kidneys.

Treatment.—The treatment of nephritis will necessarily vary, not only according to its being acute or chronic, but also according to the nature of the cause producing it ; but will consist chiefly in general and local depletion, a more or less liberal administration of mercury, gentle laxatives, anodynes, warm fomentations, and the warm bath ; and at a later period, in a regulated diet, and certain remedies calculated to diminish the acrimony of the urine, and allay the irritation remaining in the urinary passages generally. Whether the disease make its approach insidiously, or the attack be abrupt, and indicated by a more decided development of general febrile disturbance and local pain, provided the age and strength of the patient permit, general blood-letting may be had recourse to in the first instance ; its repetition being determined by the effect produced, and by the urgency of the symptoms present. The insidious form of the complaint, however, seldom displays much activity, as indicated either by general febrile symptoms or by local pain ; and indeed appears not unfrequently to supervene upon a bad and broken-down constitution. Hence any very energetic treatment is seldom justifiable or safe. When, therefore, in any case, general depletion is no longer deemed prudent, local bleeding, by means of cupping or leeching to the loins, will prove a most excellent substitute :—the quantity of blood abstracted here, also, being regulated by the circumstances just mentioned.

After depletion the patient may be placed in a warm bath, or a large warm poultice or hot fomentations may be applied to the loins. In every such case, as in other acute inflammations, it is at all times a safe practice to administer mercury freely, so as to bring the system under its specific influence. For this purpose, two or three grains of calomel with a grain of opium, and, unless sickness prevail, one-fourth of a grain of tartar emetic, may be given every four, five, or six hours; and should this not act upon the bowels, an occasional dose of castor oil, or a castor oil glyster, may be interposed. The patient should be confined to bed; he should carefully avoid all exertion, and be put upon slops: he may be directed to take some gentle diaphoretic, as a mixture of liq. ammon. acet., with or without eight or ten minims of antimonial wine, according to the state of the stomach, every six hours. Under this treatment and a free use of well-made barley-water, or some other mild demulcent drink, the disease will for the most part be found to give way. In some instances, stimulating and anodyne liniments, or belladonna plaster, or even tartar emetic ointment, or a blister, to the loins, have been found of service, especially on the approach of convalescence.

When by the above means the disease has been subdued, the patient should continue to make use of moderate, bland, and demulcent articles of diet for some time; and with a view to remove any remaining irritation of the urinary organs, may take a little of the decoction of uva ursi, or infusion of pareira, or of the buchu leaves, with or without a few grains of the sesquicarbonate of soda, two or three times a day; and should the bowels require to be opened, a little castor oil, or two scruples or a drachm of magnesia, with half a scruple or a scruple of rhubarb, will perhaps answer the purpose better than most other laxatives. Should mercury have been given, as soon as the system becomes af-

fecting it may be withdrawn ; and as a substitute for opium, about half a drachm of tinct. hyoscyami may be given with each dose of any medicine recommended in mixture.

When the disease is connected with the presence of calculous matter, similar principles of treatment must be kept in view, only bearing in mind that anodynes, such as opium, either given by the mouth or by glyster; conium, or hyoscyamus, and the warm bath and fomentations, will be more urgently required, as the cause of pain is often fixed and beyond our reach ; and moreover, as the disease is, under such circumstances, liable to frequent returns, much caution will be required not to exhaust the powers of the patient by too active an application of the remedies pointed out. In such cases, too, the patient must be enjoined to observe a strictly regulated diet and regimen, and to employ remedies calculated to diminish any tendency to nephralgic irritation, for a considerable time after an attack, in order, if possible, to ward off a recurrence of the disorder, which is at all times to be apprehended.

When the disease is a consequence of a scrofulous affection of the kidneys, the treatment, though the same in principle, must be comparatively gentle ; whilst mercury in particular, must be given with considerable reserve, or altogether dispensed with : here also it is of great importance, by bland but nutritious diet, gentle tonics, and country air, to endeavour to improve the general strength. When, on the other hand, the disease is connected with fungoid or other organic change of the kidney, although a cautious and gentle use of the more mild remedies enumerated, may afford temporary relief and prolong life, all hope of cure from the resources of art is altogether out of the question. Should the disease appear to depend upon irregular gout, besides other remedies, it will be right to endeavour to recall the gouty inflammation of the joint by the use of hot pedi-

l uvia containing mustard meal, or by the application to the joint of a mustard poultice: or if the affection of the kidneys merely result from cantharides, copaiba, or any other irritating substance taken into the stomach, little more in general will be required than to withhold the further use of the offending article, place the patient in a warm bath, and allow him a plentiful supply of barley-water, or some other bland, demulcent drink.

CYSTITIS, OR INFLAMMATION OF THE BLADDER.

Acute cystitis, or acute inflammation affecting the tunics of the bladder generally, is extremely rare as an original or idiopathic disease, being, in a large majority of instances, a merely secondary effect, either of a calculus lodged within the bladder, of diseased prostate, stricture, or diseased kidney; but whether idiopathic, or occasioned by one or more of these causes, or by a mechanical injury, it is characterised by pain, fulness and tension in the hypogastric region, frequent and difficult or painful micturition, and by a discharge of mucus, puriform matter or blood mixed with the urine. The pain is greatly aggravated by pressure, by coughing and sneezing, by straining at stool, or by any considerable or abrupt movement of the body; and in severe cases, especially when the urine is retained, has been observed to extend to the perinæum, to the rectum, to the sacrum, and to the loins. These symptoms may be preceded by chilliness, and are accompanied or presently succeeded by a hot skin; a frequent, hard pulse; a white tongue; thirst, eructations, nausea or vomiting; together with great restlessness, and a remarkable sense of anxiety and distress. Should the symptoms not be relieved, the constitutional irritation and mental agitation become ex-

treme; singultus supervenes; the patient gets delirious or comatose; the powers of life are rapidly exhausted, and death soon closes the scene.

Ordinary forms of acute cystitis much more commonly commence in, and are for some time in a great measure confined to the mucous membrane of the organ; in which case the constitutional symptoms as well as the local pain are less urgent, whilst the frequent desire and the repeated, violent, and often ineffectual efforts to void urine are perhaps even more distressing than when the disease originally attacks the muscular and cellular tunics: in other respects, these two forms of the disorder very much resemble each other; for as inflammation of the deeper tunics may extend to the mucous membrane, so may inflammation originally affecting the mucous membrane extend to the entire parietes of the organ, producing thereby nearly the same symptoms, and leading ultimately to the same fatal result.

Acute cystitis very frequently terminates in the *chronic* form of the complaint; but whether the latter prove a mere sequel of the former, or whether the disease assume the chronic form from the beginning, it is characterised by frequent desire to void the urine, which is passed in very small quantity at a time, and is for the most part mixed with a considerable quantity of thin and transparent, or of viscid and somewhat opaque mucus, occasionally mixed with a little blood, or more frequently, with a matter furnishing the characters of pus. The urine has often a strong and offensive smell, and frequently manifests an alkaline reaction, or actually deposits a greater or less quantity of the earthy phosphates. There is seldom much febrile disturbance present, although, from the almost incessant irritation and excitement to which the patient is subjected, alternations of heat and chilliness, almost amounting to hectic, are by no means unfrequent; the pulse is usually accelerated and

somewhat hard, and the tongue foul, with thirst, nausea, eructations, loss of appetite, and occasionally vomiting. The symptoms, however, necessarily vary accordingly as they result from a mechanical injury, from calculus, organic disease of the bladder, stricture, diseased prostate, a diseased kidney, or from acrid substances taken into the stomach.

Of course, acute inflammation of the general tunics of the bladder may terminate in *resolution*; it may terminate in a greater or less degree of permanent *thickening*; it may terminate in *adhesion* to the neighbouring parts; or an *abscess* may form, which may burst into the cavity of the bladder itself, or into the cavity of the peritoneum; into the rectum, or into the cellular tissue surrounding the rectum, the neck of the bladder, or uterus. Such a termination, nevertheless, is exceedingly rare, although from extension of the inflammation the cellular tissue in the neighbourhood not unfrequently suppurates, especially in the more obstinate and subacute forms of the complaint. *Gangrene* from cystitis is even more rare. Chronic cystitis, on the other hand, if long continued, almost uniformly leads to considerable thickening, not only of the mucous membrane, but of the entire parietes of the organ, and to remarkable contraction and diminution of the size of its cavity. With this state of the bladder, we occasionally find the mucous membrane in a state of ulceration, or with a sloughy appearance; the thickening, contraction and ulceration, however, are conditions chiefly met with in cases of chronic cystitis connected with the long-continued irritation of some immovable or obstructing cause, such as calculus, stricture, enlarged prostate, or diseased kidney.

Causes.—A predisposition to the complaint appears to be connected in many instances with a tendency to gout or dyspepsia; it is more frequently met with in the male than in the female, and in both sexes it more commonly occurs

beyond than previous to the middle period of life. The exciting causes are numerous: in its mildest form the disease is frequently occasioned by the merely irritating quality of the urine now and then observed in the dyspeptic of either sex, or by the irritation communicated to the bladder by a disordered uterus in the female. Its severer forms may be produced by exposure to damp and cold; by cantharides applied externally; by cantharides, turpentine, or copaiba, taken into the stomach; by a mechanical injury; by foreign bodies accidentally introduced into the bladder; by organic disease of the bladder or neighbouring parts; by suppurative disease in the pelvis; by a calculus, a stricture, or enlarged prostate; by organic disease of the kidneys; by that diseased function of the organs which gives rise to the various phenomena of gravel; and by an injury or other disease of the spine. It may occur in connexion with the irregular forms of gout.

Diagnosis and Prognosis.—The existence of acute cystitis will in general be easily recognized by the seat and character of the pain; by the frequent, urgent, and often unsuccessful efforts to void urine; and occasionally also by the appearance of the secretion; whilst corresponding symptoms, though probably less severe, together with even more marked changes in the urine, will for the most part enable us with equal facility to detect the chronic form of the complaint. The most important part of the diagnosis will consist in determining the nature of the cause producing the disease in any individual case, inasmuch as a knowledge of this will constitute the principal grounds upon which we are to found both our prognosis and the details of treatment. When the disease is acute, we ought to ascertain whether it be a first attack, or whether the patient have previously suffered from the disorder either in its acute or chronic form. If we find that it is a first attack; that it has come on suddenly; that

the patient is young; is not of a highly scrofulous habit, nor the subject of stricture, calculus, or organic disease of the bladder or neighbouring parts; that he has never manifested any indication of diseased kidney, by pain in the loins, or by a discharge of blood or other matter along with the urine; or that the patient, if old, does not labour under disease of the prostate; or, in either case, that the disorder has not been preceded by symptoms of gravel, nor by the use of cantharides, turpentine, or copaiba, we may fairly conclude that the case is idiopathic, probably arising from cold and damp, and that under proper treatment the patient will speedily recover. If, on the contrary, we find that the patient has previously suffered from acute or chronic cystitis, we ought at all times to apprehend that the disease is not altogether idiopathic, but that it probably exists in connection with some local lesion or obstruction, and ought accordingly to inquire carefully into the state of the kidney, the prostate, the rectum, urethra, and of the bladder itself; or, if the patient be a female, institute an inquiry into the position, and into the functional and structural condition of the uterus.

When occasioned by original disease of the kidney, it will very commonly be found that the patient is young, and of a strumous diathesis; that there has been pain or uneasiness felt in the loins; and that blood or puriform matter, or both, have appeared in the urine at a very early period of the disorder. When connected with enlarged prostate, the disease usually occurs in old people: we probably find that the patient has long suffered from an inability to retain his urine for any length of time; that he leans forward when he attempts to evacuate the bladder; that the urine flows or rather dribbles very slowly from him; that the inconvenience is very liable to be increased by slight causes; and that the patient often experiences symptoms of tenesmus,

rigors, or paroxysms much resembling ague. When occasioned by stricture, the existence of the latter will be rendered sufficiently obvious by the small, forked, or twisted stream presented by the urine as it flows from the urethra, and by the violent contraction of the abdominal muscles during micturition. A calculus in the bladder may be suspected from pain now and then felt at the extremity of the penis; from a sudden stoppage of the urine whilst in the act of evacuating the bladder; from an occasional admixture of blood with the urine, especially after exertion, and often accompanied by a desire to go to stool; and from jumping, or any sudden effort, producing pain in the bladder. Its existence may often be positively determined by the employment of the sound. Organic disease of the mucous coat of the bladder may be suspected from the negative evidence of the above causes being absent, and may sometimes be recognized by a cautious application of the sound. Tumors, or other structural diseases of the uterus or rectum, are to be detected by manual examination. When the complaint results from diseased spine there is no pain; the patient has neither the desire nor the power to void his urine, whilst the secretion itself is for the most part highly ammoniacal, and often extremely offensive to the smell. It may be observed in conclusion, that in idiopathic cystitis, whether acute or chronic, the prognosis is favourable, unless there has been very great neglect; and the same may be said of cases arising from cantharides, turpentine, or copaiba; whereas, in cases of secondary cystitis, the prognosis must be determined entirely by the nature of the primary cause. If in any case of cystitis the function of the kidneys have been so much interrupted by an insuperable obstruction of the bladder as to affect the brain, and induce somnolency, torpor, coma, or convulsions; the prognosis becomes most unfavourable, as the patient, in the majority of

such cases, speedily dies. A surgical operation to evacuate the bladder, will, under such circumstances, afford perhaps the only chance of saving life.

For the means of detecting blood, pus, or mucus in the urine, see the diagnosis of nephritis.

Treatment.—The indications of treatment are, first, to remove if possible the exciting cause, if any exist at the time; secondly, to subdue the inflammation; thirdly, to allay the irritability of the bladder, so as to enable the patient to desist from frequent straining; and lastly, to remove any remaining irritation of the mucous membrane of the urinary passages generally.

Having ascertained, and as far as possible removed, the exciting cause of the complaint, we must next endeavour to fulfil the second indication, that of subduing the local inflammation. The most powerful remedy for this purpose is, undoubtedly, blood-letting, general and local. When the patient is young and of good constitution, and especially when the general febrile disturbance is considerable, with a full and strong pulse, one or two moderate bleedings from the arm will often prove a most excellent preparatory step to other means. Should any doubt arise as to the propriety of general blood-letting, local depletion will be found a most admirable substitute, whilst it is one which can seldom altogether be dispensed with, except in some of the most chronic forms of the disorder, and in the most enfeebled constitutions. The local bleeding may be effected by means of leeches to the pubes or to the perinæum, the number varying from 5 or 6 to 15 or 20; the number as well as their repetition being determined by the urgency of the symptoms and the powers of the patient. In other instances, cupping from the perinæum, or from the sacrum, has proved a valuable remedy; but whether we employ cupping or leeching, the operation should be followed by poultices or

hot fomentations, either of which may be assiduously applied at all times. In some cases a general warm bath, or the hip bath twice a day, will be found to afford much relief both to the constitutional and local symptoms.

The patient should be confined to bed; his diet should be of the lightest kind, consisting of mild farinaceous preparations, such as arrow-root, sago, gruel, light puddings, or milk, if it agree with the stomach: his drink may consist of well-made barley-water, linseed tea, and such like demulcent fluids. His bowels should be kept open either by mild injections, or by an occasional dose of castor oil, or a little magnesia and rhubarb. As a general antiphlogistic medicine, at an early period of the complaint, a grain of calomel, half a grain of opium, and a quarter of a grain of tartar emetic, may be given twice or thrice a day in very acute and recent cases, together with a mixture containing the liq. ammon. acet., mucilage, and about 15 or 20 minims of spt. ether nitric, with or without 10 or 15 minims of vin. antimon. pot. tart., or vin. ipecacuanhæ, according to the state of the stomach, with a view to promote a gentle perspiration: the spt. æther nit. has appeared to render the urine less irritating. In less severe cases, or after repeated attacks, the remedies, although the same in kind, must be employed with greater caution and reserve, especially depletion and mercury. Having by such means fulfilled the second indication, we next proceed to the third, that of allaying the morbid irritability of the bladder, and thereby enabling the patient to desist from straining efforts to void his urine. This is a most important indication; for as long as the patient persists in his frequent and violent straining, so long will the local irritation be kept up, in spite of the most active measures, however judiciously applied. The means already enumerated are undoubtedly calculated indirectly to effect this desirable object; but that which suc-

ceeds best is opium, or some other anodyne applied more immediately to the seat of the disorder. For this purpose, a glyster, consisting of 2 or 3 ounces of thin starch, and from 20 to 30 minims of laudanum, or, what is perhaps better, as being less liable to be rejected, a suppository, consisting of from 1 to 2 grains of opium, and 3 or 4 of the extract of conium, or extract of hyoscyamus, may be applied morning and evening, taking care, either by means of gentle laxatives or mild glysters, to counteract the constipation such a practice is likely to occasion. If by these applications we can succeed in enabling the patient to desist from repeated straining, we shall for the most part have the satisfaction to observe the disease subside with comparative rapidity; and even if it depend upon an immovable cause, that the distress of the patient will at least be greatly alleviated. When the disease has been suspected to be attended with ulceration of the mucous membrane, and especially when connected with calculus, the occasional injection of a tepid mucilaginous fluid into the bladder has sometimes afforded temporary relief to the patient. Such applications, however, if admissible at all, require great circumspection.

The last indication, is to remove any remaining irritation of the mucous lining of the urinary passages generally. This part of the treatment is applicable to the more advanced stage of the acute, and to almost every stage of the chronic, forms of the disorder. Not the least important means of effecting this is, by so regulating the diet and regimen of the patient as to secure a healthy digestion and assimilation, and the consequent secretion of healthy urine. As medicines, the decoct. uvæ ursi, the infus. pareiræ, and infus. diosmæ, will be found amongst the most useful; either of which may be given with an acid or an alkali, accordingly as an alkaline or acid condition of the urine shall be found to indicate.

RHEUMATISM.

Rheumatism is a name under which, in modern times, several forms of disease have been included; diseases which, although they have some symptoms in common, and are occasionally observed to pass into each other, differ nevertheless in many respects, both as regards their general character and progress, and their respective modes of treatment.

Rheumatism was very imperfectly distinguished by the ancients, who appear to have treated of it, in common with gout, under the general name of arthritis, employing at the same time, certain subordinate terms, to express the varieties of the disorder depending upon the particular part of the body affected. Subsequent writers designated rheumatism *arthritis vaga*, from its being more liable to change its seat than gout. Ballonius appears to have been the first, accurately to discriminate and describe the disorder, and gave to it the name of rheumatism. In this country it was very imperfectly known till the time of Sydenham, who, about the year 1670, published a very accurate description of it. More recently, rheumatism has been very commonly divided into the *acute* and *chronic*; the former being distinguished by the presence of a considerable degree of febrile action, together with acute inflammation in the parts affected; whilst in the latter, the febrile action and symptoms of local inflammation, are either slight or altogether absent. Nevertheless, in modern, as in ancient times, divers names have been bestowed upon individual forms of rheumatism, according to the particular part affected; but inasmuch as almost every muscular, tendinous, and ligamentous structure of the body appears to be susceptible of rheumatic disease, such sub-divisions would be endless, and could not fail to prove

exceedingly embarrassing to the student. For practical purposes, therefore, it will perhaps be most convenient to consider the ordinary varieties of rheumatism under the three following heads:—1st. rheumatitis, acute rheumatism or rheumatic fever; 2. rheumatagra, subacute rheumatism or rheumatic gout; 3. rheumatalgia, arthrodynia, or the purely chronic rheumatism of authors.

RHEUMATITIS, ACUTE RHEUMATISM OR RHEUMATIC FEVER.

Rheumatitis usually commences, like the phlegmasiæ, with a sense of lassitude and rigors, succeeded by heat, thirst, anxiety, and restlessness; which symptoms are soon followed by severe pains affecting different parts of the body, but chiefly attacking the larger joints, as the shoulders, elbows, wrists, knees, and ankles. These pains are extremely tensive and pungent, they are observed to follow the course of the muscles, and the parts are so acutely sensible, that the slightest touch or motion causes the patient to cry out. The pain is generally succeeded in a short time by some degree of swelling and redness of the affected joints, the swelling being very commonly attended with some slight mitigation of the pain for a time; nevertheless, both the pains and the febrile symptoms pretty uniformly suffer an aggravation towards night. The pains are by no means confined in every instance to the joints; they may take place in almost any muscular, tendinous, or ligamentous structure of the body; they sometimes attack with great violence the muscles of the back and loins; those of the abdomen or ribs; and more rarely the diaphragm: the pains in the back, loins, ribs, and abdomen, are chiefly felt on any attempt being made to move; whereas, when the diaphragm is affected, the pain is more or

less constant, is exceedingly aggravated by the act of breathing, and is chiefly complained of at the scrobiculus cordis, shooting through towards the spine. So long as the febrile excitement continues severe, the inflammation is liable to quit one joint and attack another; and again, perhaps, to leave that and return to the joint originally affected. This tendency to shift its seat at an early period of the complaint, forms a striking feature of acute rheumatism, and serves in some measure to distinguish it from gout, to which it is very closely allied, but which, in a large majority of cases, continues fixed in the joint originally attacked. At this early stage of the disorder, the pulse is usually full, hard, and frequent, with great heat and dryness of the skin; for although profuse sweats do not unfrequently break out during the first few days, they are generally observed to be extremely partial, and to produce no sensible relief whatever to the patient's sufferings. Notwithstanding the high febrile action present, the functions of the brain are very rarely disordered, even in a slight degree, and the countenance is for the most part rather pale than flushed, and in consequence of the presence of a clammy perspiration, often presents a peculiar shining or greasy aspect; the tongue is white and furred, but generally moist, the moist white fur usually communicating to the surface of the organ a very characteristic creamy appearance; the urine at the commencement is commonly pale, it afterwards becomes high-coloured, and on the subsidence of the fever deposits a lateritious sediment.

It has already been observed, that the fever and the pain generally suffer an exacerbation towards evening; the fever, however, often remits, and occasionally subsides and goes off altogether, without the patient experiencing any material relief from pain: indeed the fever and the pain

do not appear to bear any very essential relation to each other; for although it be true, that if by a bold and active depletion we succeed in cutting short the disease, the fever and pain will occasionally both subside and disappear, yet this is by no means the case in every instance; we may subdue or remove the fever almost entirely, whilst the pains in the joints shall continue but little abated.

The disease may be protracted for one, two, or three weeks, or even longer, with more or less fever; and may then disappear altogether; or it may pass into one of the less acute forms of rheumatism to be noticed hereafter.

Terminations.—Acute rheumatism may, and usually does, terminate in *resolution*. It constitutes a striking peculiarity of ordinary rheumatic inflammation, that it never terminates either in *suppuration* or *gangrene*. It has occasionally appeared to give rise to suppuration in the neighbouring cellular tissue, but even this is of extremely rare occurrence; neither does it terminate in *adhesion* properly so called. A very common effect of rheumatitis, is a copious effusion of synovial fluid into the capsules of the affected joints, or into the sheaths of the tendons and bursæ mucosæ involved in the disorder: it is a sequel attended with little inconvenience and no danger; it will in general gradually disappear spontaneously, and if not, its removal may be materially promoted by art. There is, however, one effect of rheumatitis, which is but too frequently witnessed, and which calls for more particular attention; that is, a metastasis, as it has been injudiciously called, to an internal organ, by which that organ becomes affected with acute inflammation. This reputed metastasis often takes place without the inflammation quitting the joint or joints primarily affected, constituting apparently a mere part and parcel of a general rheumatic disease, and when consequently it cannot properly be regarded as a metastasis: in

other instances, the ordinary rheumatic symptoms are extremely equivocal, slight, or fugitive, whilst the internal inflammation forms almost the only, or at least by far the most prominent, feature of the case: in others, the inflammation quits the joints and is immediately succeeded by the internal affection: or, the internal inflammation supervenes at the very instant, as it were, that the original inflammation begins to subside in the affected joints.

The organs and parts which have been observed to be affected with inflammation in connection with rheumatitis, are the heart, the brain, the lungs, the stomach, the bowels, and the sclerotic coat of the eye. Inflammation of the membranes of the heart is out of all proportion most frequently met with, not even excepting inflammation of the sclerotic coat of the eye. Indeed, a morbid condition of the heart is so very familiar a complication in rheumatitis, that it appears to be more correct to regard it as constituting a part of the rheumatic disease than as an accidental and only occasional occurrence from metastasis. The morbid condition of the heart, nevertheless, is by no means uniform in its kind. In almost every case of acute rheumatism, we find the organ remarkably irritable, as indicated by the violence of its action, and by the facility with which it is thrown into a state of considerable excitement; a degree of excitement sufficient in some instances, especially after copious depletion or in chlorotic subjects, to produce a distinct *bruit de soufflet*, calculated to mislead to a belief in the existence of some more serious lesion. This morbid irritability is however of little moment, and usually subsides as the disease is subdued by appropriate remedies. In other cases, but much more rarely, the heart is liable to be seized with a severe crampy or neuralgic pain, which proves exceedingly distressing to the patient, and is compared to a grasping or squeezing of the organ: this is

for the most part of short duration, and generally yields speedily to moderate depletion. A much more common, and unfortunately a much more serious affection, is that which is regarded as the ordinary metastasis to the heart. This consists in acute inflammation of the external or internal membrane of the heart, or of both of these structures at the same time, constituting accordingly pericarditis or endocarditis, or both. These complications are by far more common than is generally supposed, and are very frequently altogether overlooked, in consequence of the obscurity of the symptoms to which they give rise in many cases. The student ought at all times, therefore, to be attentively on the watch; and by taking alarm at the slightest indication of disturbance of the heart, and by a judicious application of auscultation, endeavour to steer clear of that which must at all times prove a most serious, and not unfrequently a fatal oversight; always bearing in mind also, that in proportion to the youth of the patient, is the complication more likely to take place. For the details of this complication, we must refer to the article pericarditis.

RHEUMATAGRA, SUBACUTE RHEUMATISM, OR RHEUMATIC GOUT.

This form of rheumatism may be primary, or it may prove a sequel of rheumatitis; when primary, it is observed to arise from causes precisely the same as those known to induce rheumatitis, and it attacks the same parts, so that it may be regarded as little more than a different degree of the same disorder. It is attended with swelling, pain, and stiffness of the affected joints, and most frequently attacks the ankles, knees, wrists and elbows. The pains are occasionally very severe and distressing; they are for the most part found to be aggravated by ex-

ternal warmth; and to suffer an exacerbation towards evening, which exacerbation usually lasts through a great part of the night. This disorder is attended with little or no febrile disturbance, and consequently the general indisposition is much less apparent; but it sometimes continues to harass the patient for a period of several weeks or even months, quitting one part only to attack another. There is seldom any redness found to accompany the swellings, but it is not unusual to observe them attended with œdema of the parts adjacent. When the local swelling is considerable, a fluctuation can often be distinctly felt, evidently depending upon a copious effusion of synovial fluid; and when the disease has continued a length of time in any individual joint, we occasionally have the mortification to find such rigidity and stiffness produced, as to occasion complete immobility, together with a degree of numbness and weakness of the limb generally, as almost to amount to a state of complete paralysis; indeed, when the disease attacks the smaller joints, as those of the fingers, which now and then happens, it is not very unusual to find, not only immobility of the joints, but considerable distortion, as if they had been actually dislocated and displaced. Such deformities are by no means uncommon, but are perhaps most frequently the result of gout, a disease closely allied to, and in many instances not easily distinguishable from, this form of rheumatism.

RHEUMATALGIA, OR CHRONIC RHEUMATISM.

This is most frequently a mere sequel of one of the other forms of rheumatism, although it may and does occasionally occur as an original affection, without any previous inflammation or swelling. It is characterized by pain and stiffness, or sometimes by mere stiffness and coldness of the joints or other parts of the body affected. It differs

from rheumatitis in the absence of all fever; it differs from rheumatagra in the pains being less fixed and constant, and in the swelling not being necessarily present; and it is distinguished from both, by being generally relieved instead of being aggravated by external warmth. The disorder appears to be readily and considerably influenced by changes in the state of the atmosphere; so much so, indeed, that individuals who are the subjects of rheumatagia, become, as it were, living thermometers;—can pronounce, from their feelings alone, the nature of the changes that are taking place in the atmosphere, and experience wandering pains over the whole body from very slight vicissitudes in its temperature, or even in its degree of humidity. The pain is felt more particularly on any attempt being made to move the limb, which is moreover very frequently affected with a remarkable degree of torpor, debility, and coldness; a state of the limb, indeed, occasionally amounting to paralysis.

Lumbago is a name given to what may be regarded as a modification of rheumatagia attacking the loins. It may affect the loins generally, it may affect one side only, or it may be confined to so small a space that it may be covered with the tip of the finger, either immediately over the spine, or on either side. This form of rheumatagia occasionally makes its attack suddenly upon making some violent exertion, or what is much more common, it makes its approach gradually, the patient feeling a stiffness and a dull aching pain at first, which at length becomes acute, so that the patient is unable to move without experiencing extreme suffering, and especially on attempting to raise the body from the flexed to the upright position. *Lumbago* is in some instances attended with a corresponding affection of the hip joint; much more frequently, however, it is combined with a single or double *sciatica*, in

which the pain is observed to commence at the part where the sciatic nerve quits the pelvis behind the great trochanter, and extends down the limb in the course of that nerve; it is sometimes extremely severe, it may be felt in the whole course of the nerve along the thigh, leg, and foot, or it may be limited to some particular point only of the distribution of that nerve, and is very often accompanied by tingling, numbness, cramps, or, especially in old cases, by a remarkable coldness and weakness of the limb. The anterior crural nerve is rarely affected in this manner. Chronic rheumatism, particularly that which succeeds to a more acute form of the complaint, now and then fixes in the heels and soles of the feet, proving exceedingly painful and stubborn, and greatly crippling the patient.

Predisposing causes.—An irritable plethoric habit appears to be most favorable to the production of rheumatism, especially if the individual possessing such a constitution is liable to perspire freely on making exertion; indolence and a sedentary life also increase the susceptibility. Although occasionally met with in children, and repeatedly before the age of puberty, the age most strongly predisposing to the disorder is unquestionably that of the greatest vigour, or from puberty to the fortieth or fiftieth year. As to sex, the disease more frequently occurs in men than in women, but this is in all probability rather to be ascribed to the former being, from the nature of their pursuits, more exposed to the exciting cause than the latter. It has been imagined that a certain state or condition of the human system, induced by a changeable climate or even by an unsteady season, may predispose to it. By far the most frequent, as well as most powerful, predisposing cause, is unquestionably a previous attack; those who have once suffered from rheumatism are uniformly more or less liable to a recurrence from comparatively slight causes:

this tendency, indeed, of a preceding attack to engender a predisposition to a recurrence is so great, that after a time some unfortunate invalids are seldom entirely free from the complaint; and are so extremely susceptible of the operation of the exciting cause, that they are affected by changes in the atmosphere not in the least cognizable to an ordinary person. The use or abuse of mercury also proves an influential predisposing cause of the disorder.

The *Exciting Cause* of rheumatism is cold applied to the body, the variety and degree of the disease depending much upon the state and circumstances of an individual at the time of its application; but an almost invariably co-operating cause is the body's being previously overheated or fatigued; for either of these conditions of the body singly, and more particularly when combined, operate most powerfully in producing the complaint; the circumstances, in short, most favorable to the production of rheumatism, are, cold and moisture, acting upon the body of a person previously heated, perspiring, and fatigued. Partial rheumatism, however, is often induced by partial exposure; in this way a stiff neck is repeatedly occasioned by a carriage window being open and allowing a current of cold air to blow upon that part of the body; in this way, sitting upon the damp grass often induces sciatica; and in this way, discontinuing an accustomed article of dress, induces rheumatism in the shoulders or in the loins; nay, indeed, we occasionally appear to have an individual nerve affected in this way, as is observed in the painful neuralgia of the side of the face and head, or even paralysis of the portio dura, from exposure of these parts to a current of cold air.

Diagnosis.—When exposure to wet and cold is succeeded by general febrile symptoms and aching pains in the limbs, it is not at all times easy to determine at first, whether such pains are referable to common catarrhal fever, or will ter-

minate in or proceed to genuine rheumatism. This uncertainty, however, in general soon vanishes, as, in a short time, the disease, if rheumatism, discovers its true character by fixing on some of the large joints, and affecting them with severe pain and swelling. It must nevertheless be acknowledged, that acute pains, shooting in the direction of the muscles, decidedly of a rheumatic character, are not unfrequently combined with symptoms of a common catarrh, during the prevalence of bleak and damp weather, constituting a sort of compound disease.

Rheumatism, especially that form of it called rheumatagra, is not at all times very readily distinguished from gout, to which it appears to be very closely allied; but although they now and then bear a striking resemblance to each other, and not unfrequently seem to be combined, there are a few circumstances which will for the most part enable us to form a correct diagnosis. Gout generally attacks people advanced in years; whereas rheumatism is prevalent in early and middle life: gout most frequently occurs in persons of rank, who live luxuriously and lead a sedentary life; whereas rheumatism is most common amongst the poor, who are necessarily exposed to hardship, cold, and fatigue: gout is generally hereditary; which is at least much less decidedly the case in rheumatism: rheumatism usually arises from an evident external cause; whereas gout generally makes its attack spontaneously, without any manifest exciting cause whatever: gout is usually confined to the smaller joints, and rarely affects above one at a time; rheumatism on the contrary, commonly affects the larger joints, and attacks several at the same time or in succession. *Uterine phlebitis* occasionally gives rise to inflammation and swelling of the joints, very closely resembling acute rheumatism. It is to be distinguished by its occurring shortly after de-

livery or abortion; by the high degree of constitutional irritation which accompanies it; by the rapid, sharp, contracted pulse; the dry brown tongue; the great prostration of strength and other typhoid symptoms; occasionally, by the simultaneous inflammation and suppuration in various parts of the subcutaneous cellular texture; and by a strongly marked disposition to inflammation of the serous membranes of the chest and abdomen. There is reason to believe that phlebitis in other parts, as well as certain animal poisons, now and then give rise to corresponding symptoms.

Syphilitic pains are to be distinguished from those of chronic rheumatism by the history of the case; by the severe pains in the head; by the ulcerated throat, and cutaneous eruptions, which accompany or presently succeed to them. From mercurial periostitis, chronic rheumatism is to be distinguished also by the history of the case; by the pains affecting chiefly the head and long bones; by the soft or hard swellings which frequently form on some part of the cranium; and by the painful nodes occurring on the clavicles, sternum, or long bones of the extremities.

Rheumatism, or rather certain modifications of rheumatic disease, are not at all times easily distinguished from *paralysis*. When either acute or chronic rheumatism gradually leads to paralysis, which is by no means uncommon, the history of the case will in general remove all difficulty; cases, however, do occur in which acute rheumatism leads to actual disease of the spine; as now and then happens, when acute rheumatism, occurring in scrofulous subjects, fixes on the vertebræ of the neck. The vertebræ most commonly involved, are the first and second; the ligaments become diseased, the tooth-like process and its ligament get involved, the former probably becoming denuded and carious, and the latter ulcerated; so that in

some instances, after suffering severe pain of a neuralgic character, the patient becomes partially or generally paralytic, and the disease terminates fatally; sometimes in a remarkably sudden manner.

There are other cases, however, in which the diagnosis between rheumatic disease and paralysis is much more difficult; for it is a well-established fact, that exposure to damp and cold will in some individuals give rise at once to paralysis; in others to rheumatic disease, terminating in paralysis; and in others, to a combination of the two affections at the same time: thus we have known a person, after exposure to damp and cold, seized with a complete paralysis of the lower limbs; we have known another, after a similar exposure, seized with severe lumbago, with or without sciatica, terminating in paralysis; whilst in a third, we have known the same cause produce almost complete loss of sensation of the lower limbs, but combined with inflammation of the joints, in some of which, pain was felt in a slight degree, by the patient. Such cases are to be distinguished from original disease of the spine, chiefly by the history of the case; a knowledge of the occupation of the individual; and by attentively watching not only the character, but the progress of the symptoms: a mere knowledge of the facts enumerated will, however, often be sufficient to guard us against any very serious practical error in such doubtful cases.

There is another modification of rheumatic affection, which is liable to be mistaken for paralysis of a cerebral origin; and in which, very unnecessarily severe remedies and regimen have been adopted in consequence of the mistake: we mean that paralysis of the facial nerve which is not unfrequently produced by exposing the side of the face and head to a current of air. In some cases of this kind, the paralysis of motion is complete; the face is drawn towards

the opposite side, the patient is incapable of closing the eyelid of the side affected, and his features are remarkably distorted, especially when he attempts to laugh or sneeze. Such cases are sometimes preceded or accompanied by neuralgic pain in the parts, but by no means always ; and hence the occasional difficulty of diagnosis. Whenever severe neuralgic pain affects the side of the head and face, we ought always, in the first instance, carefully to examine the mouth ; as it very frequently results from the mere irritation of a decayed tooth.

The *tetanic* state induced by long-continued exposure to damp and cold, partakes a good deal of the nature of a rheumatic affection ; and, like other rheumatic affections, very commonly yields to the remedies found most successful in the treatment of the latter : and the same may be said of the paralysis of the hands, occasionally met with in those whose occupation leads them to be constantly immersing their hands in cold water.

Lumbago is to be distinguished from *nephralgia*, by the absence of sickness and other symptoms peculiar to the latter disorder ; and by the pain of lumbago being particularly aggravated by any effort made to raise the body from the bent to the erect position. From *lumbar abscess*, lumbago is to be distinguished, by the history of the case, by the severe pain felt on raising the body, by the age and habit of body of the patient, and by the absence of symptoms of hectic fever. Tumours, abscesses, or inflammation, within the pelvis, may, by pressing or irritating the sciatic nerve, give rise to all the symptoms of a violent sciatica. Milder forms of the latter are not unfrequently found in connexion with hæmorrhoids, disease about the neck of the bladder, or functional or organic disease of the uterus.

Prognosis.—In rheumatitis, the prognosis is uniformly favourable as it respects the safety of the patient, unless

inflammation of an internal organ happen to supervene; when, of course, it will be favourable or otherwise according to the importance of the part or organ affected, and according to the severity and period of the inflammation. The prognosis, however, is very uncertain, as it regards a perfect cure; the acute very frequently terminating in one of the other forms of the complaint, or at least leaving behind it an extreme tendency to a relapse; so that, with whatever confidence we may assure the patient of his safety, we cannot by any means calculate with certainty upon the perfect and permanent restoration of his health. There are, however, certain symptoms occurring in the progress of acute rheumatism, which indicate a favourable state of the disorder; these are, an abatement of the fever, an equally diffused perspiration over the whole body, with a gradual subsidence of the swellings, without other parts becoming affected.

In rheumatagra or rheumatic gout, the prognosis, although perfectly favourable as it respects the mere safety of the patient, is always very doubtful as to the period of recovery; this form of the disorder generally proving extremely obstinate and difficult of cure, and sometimes leaving behind it considerable deformity or even complete immobility of the affected joint. But in rheumatagia, or chronic rheumatism, the prognosis is more favourable, and the disease commonly much more under control, except in a few instances of obstinate sciatica.

Pathology of Rheumatism.—There prevails a very general belief, that rheumatism ought to be regarded simply in the light of an ordinary phlegmasia, consisting of local inflammation with or without secondary or symptomatic fever, according to the acuteness or severity of the attack; and as leading, by its continuance, to an increased synovial effusion, or to such thickening and rigidity of the ligaments

and other structures involved in the inflammation, as to give rise to immobility or even distortion of the affected joints. Many, however, have felt disposed to call in question this view of the nature of rheumatism; they have observed that the febrile commotion frequently prevails with considerable intensity before acute inflammation has been fairly established in the joints; they have failed to discover any uniform or positive relation between the intensity of the fever and the degree and number of local inflammations set up in the joints; and they have not unfrequently observed the fever to remit, or even subside nearly altogether, with but little apparent abatement of these local inflammations. These facts have rather inclined to a belief, that rheumatism ought not to be regarded as consisting merely in local inflammation with symptomatic fever; but rather, that the febrile state ought to be considered as original, and that the local inflammations are either a consequence of that febrile state; or, merely form an integral part of a disease, made up of fever and local inflammation. A difference between rheumatism and an ordinary phlegmasia, appears moreover to be further indicated by the peculiarities observable in its progress; its modes of termination; and in the success occasionally attending its treatment by remedies, by no means usually applicable to an ordinary phlegmasia.

It must be confessed, therefore, that our knowledge of the pathology of rheumatism is extremely imperfect, and that it remains for future experience and observation to remove the obscurity in which the subject is at present involved. There are, however, some curious and interesting facts which bear upon this question, and which, without wishing to attach any undue importance to them, we think it desirable to put collectively upon record. These

facts certainly suggest a suspicion that, either directly or indirectly, the nerves of sensation and voluntary motion, are more decidedly, if not more essentially, concerned in rheumatic disease than in the ordinary phlegmasiæ. The facts are the following:—persons threatened with an apoplectic or epileptic seizure, not unfrequently suffer from pains in the limbs, closely resembling those of certain modifications of rheumatic disease; hemiplegic patients are occasionally affected with a severe neuralgic pain of the whole of the paralysed side, very much resembling that which is now and then produced by exposure to a current of cold air; acute rheumatism is very commonly attended with a remarkable sense of weight and loss of power in the affected limb, not unfrequently terminating in a more or less complete paralysis, both of sensation and motion; the very first distinguishable effect of exposure to damp and cold, is in some instances a complete paralysis of both sensation and motion of the lower limbs; in other instances, such exposure induces lumbago, with or without sciatica, terminating in a more or less complete paraplegia; whilst in other cases, the same cause is observed to induce almost perfect paralysis of sensation and motion, together with manifest inflammation and swelling of the joints, although with scarcely any pain whatever; exposure of the side of the head and face to a current of air has sometimes the effect of inducing a severe neuralgic pain of these parts; at other times it causes a complete paralysis of the facial nerve without any pain; whilst in others it gives rise to more or less neuralgic pain, together with complete paralysis of motion in all the parts which derive their motive power from the facial nerve; lastly, the tetanic state induced by long exposure to damp and cold presents a good deal of the character of rheumatic disease; and, contrary to

what is observed in traumatic tetanus, very commonly yields to the remedies found most successful in the treatment of rheumatic affections in general.

Treatment.—As there are various modes of treating acute rheumatism, it will be right to give a short account of each ; only premising, that whatever mode of treatment may have been adopted, should inflammation supervene in an internal organ, the antiphlogistic treatment applicable to that local inflammation in its idiopathic form, must be immediately substituted.

Treatment with colchicum and purging.—One of the most powerful, efficient, and speedy means of removing acute rheumatism, consists in the exhibition of the powdered cormus, or some other preparation of colchicum, in combination with such a quantity of purgative materials, as to produce active purging. This mode of treatment appears to be most applicable to very acute cases occurring in young and robust subjects ; when the febrile symptoms run high, and partake of the most exquisitely phlogistic character. But although peculiarly applicable under these circumstances, it will be found an efficient and successful remedy in many cases occurring in less vigorous subjects, and when not seen till a somewhat later period ; nevertheless, it has appeared, that the more acute the attack, and the earlier the period at which the practice is adopted, the more successful has it proved.

To the adult, four, five, or six grains of the powdered cormus may be given in a draught, containing ten grains of carbonate and a drachm of sulphate of magnesia, every four or five hours. If this combination have the effect of producing from six to eight loose stools in the course of twenty-four hours, it will in general prove sufficient ; but if not sufficient for the purpose, the quantity of purgative salt may be increased, as it will seldom be desirable to increase the

dose of colchicum beyond the quantity mentioned: if, on the contrary, the purgative effect prove too violent, it will be prudent to diminish the quantity of sulphate of magnesia, or to omit it in each alternate draught. When the medicine acts favourably, the patient experiences little nausea or sickness; the stools after a time present a peculiar pale yellow and granular appearance, somewhat resembling pea-soup; the patient probably experiences a slight sense of weight or dull pain over the forehead; the pulse softens, probably expands, and becomes less jerking and more compressible; it moreover gradually gets slower, and when the colchicum has produced its full remedial effect on the constitution, it is observed not only to be soft, more expanded, and slower, but also somewhat irregular, although without any decided intermission; in short, it is a state of pulse very closely resembling that frequently observed to result from the use of digitalis. Under this mode of treatment both the fever and the pains are sometimes manifestly alleviated in the short space of twenty-four hours; more frequently, in from thirty-six to forty-eight hours; and in a large proportion of cases, both the fever and the pains are entirely removed in a few days; and almost certainly and entirely so, as soon as the state of pulse described has been fully induced. The colchicum ought to be continued for a few days, either to the same extent, or in somewhat smaller or less-frequently-repeated doses, after the subsidence of the fever and the cessation of the pain. In very young subjects the vin. colchici may be substituted for the powdered cormus in a purgative mixture.

Cases undoubtedly occur in which the practice fails, in consequence of the colchicum disagreeing with the patient's stomach or bowels. In some persons it occasions distressing sickness and vomiting even at an early period, and when this happens it is almost as well to withdraw it at

once, and adopt some other remedy, inasmuch as when the stomach rebels thus early, it will in general prove altogether unavailing to attempt to persevere in its use with whatever caution it may be administered. In other persons, it not only produces active purging, but seems to induce a state of excessive irritation, if not of actual inflammation, of the mucous membrane of the small intestines; as indicated by the restlessness or agitation of the patient, by the frequent and irritable pulse, and by the tongue becoming red, with a disposition to get dry and brown. In this case also, the remedy may be regarded as having failed, and ought to be withdrawn; with these exceptions, however, it will be found a most excellent practice in acute rheumatism.

Antiphlogistic Treatment.—When acute rheumatism is treated on purely antiphlogistic principles, the indications are, 1st, to subdue the inflammatory fever present, and 2ndly, to mitigate or remove the inflammation in the affected joints. To fulfil the first indication, of course, general blood-letting is the most powerful remedy, but there has existed considerable difference of opinion as to the extent to which this can be carried with advantage or propriety. Some have recommended it to be adopted as early as possible, and freely repeated so long as the urgency of the febrile symptoms shall appear to indicate; whereas, a considerable majority have, notwithstanding the intensity of the fever and the buffy state of the blood, preferred only moderate general depletion, in consequence of having observed large and repeated bloodletting to fail in removing the pains in the joints; whilst it has appeared to them greatly to debilitate the patient, to render him extremely subject to a relapse, or to cause the disease to pass into one of its more chronic and less tractable forms.

The truth appears to be, that if large and repeated blood-

letting be adopted very early, whilst the febrile symptoms run high, and whilst the pains in the joints are yet extremely fugitive, frequently passing from one joint to another; it will not unfrequently be found speedily to remove both the fever and the local inflammations; whereas, if the disease have lasted some days, and the inflammation in the joints have become more fixed, such active general blood-letting will not only be less successful, but less safe; inasmuch as it will often fail to remove the pains in the joints, whilst the objections to the practice, founded upon its debilitating the patient, increasing his susceptibility, and leading to the more chronic forms of the disorder, will at least, to a certain extent, be found to hold good.

As we have no good evidence that either copious or more moderate depletion has a tendency, as has been supposed, to favour a metastasis to an internal organ, the choice must be left to the judgment and experience of the practitioner; although, upon the whole, we should prefer the more moderate depletion, perhaps in every instance, and certainly after the disease had lasted a few days. From ten or twelve to sixteen or twenty ounces of blood may be drawn, and the operation repeated, to the same or a smaller amount, on the following day, according to the severity of the symptoms and the age and strength of the patient; always bearing in mind that the buffy state of the blood is a fallacious guide, since it will often continue to appear after the disease has passed into one of its chronic forms. Besides general depletion, the local abstraction of blood by means of leeches may often be had recourse to with advantage; in the early period, however, of the disorder, when the pains are so liable to shift from one joint to another, the utility of leeching is at least equivocal; but when the pains become more fixed; or, at any time, provided the pain be very acute and distressing, eight, ten, or twelve leeches

may be applied to the part, with the almost certain prospect of affording more or less relief, and without adding to the risk of a metastasis as some have apprehended; the leeches may be followed by a light warm bread-and-water poultice if it can be borne. Another antiphlogistic remedy is purging; here, however, we find an objection to the practice, in the pain occasioned to the patient by his efforts to go to stool; nevertheless, by the judicious use of a bed-pan, the objection is in a great measure got rid of. Any of the common saline purges may be given, though it is perhaps better to secure a proper evacuation of the bowels by combining them with some more active ingredient, such as the infusion of senna, with a little of the tincture; half an ounce or six drachms of sulphate of magnesia, with an ounce of the infusion of senna and a drachm of the tincture, and repeated after four or five hours if necessary, will often answer the purpose very well: or four or five grains of calomel may be given at first, to be followed by the above draught, with or without half a drachm of vin. colchici in four or five hours afterwards. Having freely relieved the bowels, we may administer warm diluents, and some gentle diaphoretic medicine, such as the liquor ammon. acet., with a few drops of antimonial or ipecacuanha wine; or the common saline mixture similarly combined. With the view of promoting diaphoresis, and at the same time mitigating the severity of the pain, the patient may take every night, or every night and morning according to the degree of suffering and want of repose, from five to ten grains of Dover's powder; or, a grain of opium, with a quarter of a grain of tartar emetic; to each dose of either of which, may be added a grain of calomel. Many other remedies have been recommended in the antiphlogistic treatment of acute rheumatism; amongst which, are, digitalis, nitre, and carbonate of soda.

Treatment by mercury.—Mercury, in moderate doses, has already been noticed as a valuable auxiliary in the ordinary antiphlogistic treatment of acute rheumatism; but administered in larger quantity, so as speedily to induce its specific action on the system, it has in some instances been principally, and indeed almost exclusively, relied upon for the cure of the disorder. It is unquestionably a powerful, and in certain cases, a valuable and efficient remedy in acute rheumatism; and will often, especially after moderate general depletion, speedily succeed in arresting the progress of the symptoms: it moreover appears to possess the advantage of rendering the patient more secure against metastasis or its consequences. In some cases also, which have resisted other modes of treatment, and in which the local symptoms continue stubborn and severe, the free use of mercury will occasionally have the effect of quickly inducing a change for the better; and will even remove the disorder altogether, or at least bring the system into a condition to be much more favourably acted upon by remedies which had previously entirely failed. It is nevertheless a harsh remedy, and is amenable to all the objections usually urged against the violent operation of mercury on the constitution. Should the mercurial treatment be resolved upon, two or at most three grains of calomel may be given two or three times a day; and in order to prevent it from passing off by the bowels, a grain of opium may be combined with each dose; to which also may be added about a quarter of a grain of tartar emetic. As soon as the system is fully under the influence of the mineral, it must be either partially or wholly withdrawn, according to the severity of its operation; it will be expedient, however, to maintain the mercurial action with tolerable activity for a few days.

Treatment by profuse sweating.—This practice consisted in administering to the patient six, eight, or ten grains of

Dover's powder, three or four times a day, administering freely warm diluent drinks, and covering him with a load of bed-clothes, so as to force a profuse sweat, which it was deemed necessary to maintain without intermission for 24, 36, or 48 hours. This mode of treatment was at one time extensively employed, and no doubt often proved effectual in curing the disorder; but as it occasions much distress to the patient, and has been observed greatly to reduce his strength, and to render him extremely susceptible of a relapse of the disorder, it is very rarely adopted at the present day.

Treatment by Cinchona.—The cinchona has been much lauded as a remedy in acute rheumatism, not only in consequence of the rapidity with which, in some instances, it has appeared to cure the disorder; but in consequence of its doing so without that loss of strength and augmented susceptibility, which so frequently result from other modes of treatment. It is nevertheless a very equivocal remedy; and in every form and stage of acute rheumatism will often disappoint the hopes both of the patient and the practitioner. We have certainly known it to prove speedily successful in acute rheumatism in its earliest stage, and without having been preceded by any antiphlogistic treatment whatever; but such instances are extremely rare; whilst prudence dictates that such a practice ought probably never to be attempted: when, by moderate depletion and other antiphlogistic measures, the violence of the disorder has been somewhat overcome; and when the fever has taken on a manifestly remitting character; and especially when the skin has become moist, and the pulse has lost its jerk and hardness, undoubtedly the decoct. cinchonæ, or, quinin. disulph., will sometimes have the effect of putting a speedy stop to the disease; and with the assigned advantages, of

neither greatly reducing the strength nor materially increasing the general susceptibility of the patient. It must nevertheless be acknowledged, that even under circumstances apparently the most favourable, the practice in a majority of cases entirely disappoints us; the febrile excitement, the restlessness, and the pains, suffering rather an aggravation than a diminution, so as to render it absolutely necessary to discontinue its use; it is, however, when successful, a most desirable remedy, and is well worthy of a trial. Of course, on the slightest manifestation of a metastasis, it ought immediately to be withdrawn. When its use is resolved upon, an ounce or an ounce and a half of the decoct. cinchonæ may be given three or four times a day, with or without a little dilute sulphuric acid; or 2 or 3 grains of the disulphate of quinine may be substituted for it, dissolved in compound infusion of roses; taking care at the same time to regulate the state of the bowels.

Treatment of Rheumatagra, or Rheumatic Gout.—In this form of rheumatism the febrile symptoms seldom run high; and indeed, although not unfrequently original, it perhaps more commonly proves a mere sequel of the acute form of the complaint; in proportion, therefore, as the febrile symptoms are less violent, will the disease require less active measures. Large and repeated depletion is hurtful; it fails to procure the desired effect, and tends to prolong the disorder and render the patient more liable to a relapse. The principal form of blood-letting applicable to this form of rheumatism, is that by means of leeches, the number of which must be determined by the degree of local inflammation present, and, to a certain extent, by the state of the patient's constitution; but from six to twelve will generally suffice for an adult; a warm bread poultice being applied as soon as the leeches have been removed,

provided it can be borne by the patient : as a general rule, the more effectually we let blood from a part at first the better ; such a practice being much preferable to the application of merely two or three leeches only at a time. But although the application of leeches to the affected joints constitutes the most eligible form of depletion in the generality of cases of rheumatagra, it is not by any means to be understood that general blood-letting is in every instance to be neglected ; on the contrary, when the pulse is full or sharp ; when there is some heat and dryness of the skin ; and especially when the patient is plethoric, which is very often the case, one or two general bleedings will frequently prove highly serviceable and greatly expedite the cure of the complaint.

Blisters sometimes have a good effect ; but when the pain is acute, they occasionally cannot be borne by the patient, and leeches in such cases will in general be found much preferable : now and then, however, when the pain is but slight, a blister applied to the neighbourhood of the affected joint, has the effect of speedily removing it altogether : or, should the synovial effusion and consequent swelling be considerable, the repeated application of a blister will very commonly succeed, sooner or later, in completely removing them. Some have applied caustic issues for this latter purpose.

Together with the means enumerated, it will in general be well to administer such medicines as are calculated to produce a soft and moist state of skin ; for this purpose, the common saline mixture, either with or without 20 or 25 minims of antimonial or ipecacuanha wine, may be given thrice a day ; or, what is probably still better, a grain of opium, and a quarter of a grain of tartar emetic ; or from 5 to 10 grains of Dover's powder ; with half a grain or a grain of calomel, may be substituted, night and morn-

ing; the latter combinations being found to answer the two-fold purpose of acting as a diaphoretic, and as an anodyne, to allay pain and procure rest. In other instances, the saline mixture, or a combination of magnesia and Epsom salts, may be tried, with from 20 to 30 minims of the vinegar, wine, or tincture of colchicum, thrice a day; the above pills being given at the same time. In this case the purgative salt tends to obviate the constipating effect of the opium. Another remedy, which appears to combine the advantages of a powerful diaphoretic with those of an anodyne, is the application of warmth to the body, through the medium of water in various ways. The common warm bath, or, what is perhaps better, the warm salt-water bath may be employed for this purpose: they often prove of great service,—equalizing the circulation; allaying the irritability of the system; producing a soft and comfortable state of skin; and affording general relief to the uneasy feelings of the patient. Some recommend the sudatorium, which consists in wrapping the patient in flannel, and confining him in a heated room, till a copious sweat is produced: others, the douche, which consists in pumping hot water upon the parts affected: whilst others place more reliance on the use of vapour-baths.

It is in cases where there is less activity or excitement present, that the more stimulating diaphoretics are occasionally employed with advantage, such as the guaiacum, either in substance or tincture. It is, in such cases too, especially in persons of enfeebled constitution and languid circulation, that cinchona, quinine, and other tonics, have often materially assisted in restoring power and health to the patient. On the other hand, when the disease proves exceedingly stubborn, resists all ordinary remedies, and particularly when, under such circumstances, there prevails an irregularly developed and remitting form of slight febrile

excitement, with dry or harsh skin, the active mercurial treatment described under the head of Acute Rheumatism, and continued so as to affect the constitution for a short time, will sometimes produce a speedy and important change, and cause the disorder to yield to ordinary remedies afterwards. It is, however, a harsh medicine, and is only justified by the great stubbornness of the disorder, the failure of other means, and the long continuance of the patient's crippled condition.

Treatment of Rheumatalgia, or Chronic Rheumatism.—The treatment of this variety of the disease must be different according to its degree and situation in any individual case. In many instances, the affection amounts to little more than stiffness and coldness of the parts affected; in which case, warm clothing, especially flannel worn next the skin, and friction with the hand or flesh-brush, will occasionally be all that is requisite. Together with friction, however, much advantage often results from the employment of stimulating embrocations. Of these a considerable variety have been used; amongst which may be mentioned the lin. ammoniæ, lin. sapon. co., and the lin. terebinthinæ, or certain nostrums which contain the latter, known by the names of essence of mustard, and the Guestonian embrocation. Various stimulating plasters have also been recommended, such as the emplastrum picis, the e. ammoniaci, the e. ammoniaci cum hydrarg., and the c. galban. co.; applications which, independently of counter-irritation, must also prove beneficial, by defending the parts from cold, and from the influence of sudden vicissitudes, at all times so unfavourable to this complaint in all its varieties of form and situation. The internal medicines usually employed in rheumatalgia are chiefly stimulating diaphoretics and diffusible stimulants; one of the most powerful of the former is the guaiacum; of the resin itself, from ten grains

to a scruple may be taken night and morning in the form of bolus; or as we find it in the *mistura guaiaci*; or a drachm of the simple or ammoniated tincture, may be substituted, and given in a little water-gruel or barley-water. A tea-spoonful of washed sulphur night and morning, given in milk, and persevered in for some time, has occasionally afforded much relief; when given in a glass of English gin, it has appeared in some cases to be still more efficacious, although by no means so prudent or agreeable a practice. The sesquicarbonate of ammonia has also occasionally been exhibited with advantage; of which, from five to eight grains in any convenient vehicle, thrice a day, will be sufficient; or it may be given in one of the bitter infusions, or in the decoction of cinchona; or the ammonia may be given in mixture, whilst the disulphate of quinine is exhibited in the form of pill. Mustard has also been given internally; a whey made by boiling a table-spoonful of the meal in a pint of milk, may be taken to the extent of three or four ounces thrice a day, or about a dessert-spoonful of the seeds may be swallowed whole night and morning. The oil of turpentine is another stimulant of considerable power when given internally, in some cases of chronic rheumatism, and especially in stubborn cases of sciatica. It may be taken in doses of from 8 to 20 minims twice a day, promoting its effects by warm diluents; or, by hot drinks on going to bed: some have given it in much larger doses, limiting it to a single draught containing a drachm or two given at bed time, followed by a copious draught of some hot fluid, or warm white wine whey, to promote diaphoresis. In such doses, however, it is liable to irritate the urinary organs. It may be given mixed with honey, rubbed up with mucilage and syrup, dropped on sugar, or simply in plain water; but it is extremely difficult to mix it well with any fluid.

The external and internal remedies already mentioned,

when employed alone, are chiefly applicable when the disease consists generally in stiffness and coldness, without much pain. When, however, the latter prevails to any extent, which is very commonly the case, our most powerful resource is opium: it may be given in substance uncombined, to the amount of a grain morning and evening; or, what is better, it may be taken in conjunction with antimony, and occasionally a little calomel. In other cases, 10 or 12 grains of Dover's powder may be tried. Opium also, applied externally, is often of great service in affording relief from pain: two drachms of the tincture, may be added to an ounce of the lin. ammoniæ, or any other form of embrocation, and rubbed for five or ten minutes upon the part, before the fire. When the strength of the patient will permit, much benefit will often be derived from the judicious application of the warm bath, the douche, the vapour bath, and shampooing; the selection of these being left to the discretion of the practitioner, or to the result of an actual trial.

In many instances, the constitution of the patient is much impaired; and chief attention must be directed towards improving the general health, correcting the state of the digestive organs, and promoting a more vigorous circulation; such practice not only promoting the recovery of the patient from his present attack, but proving the most certain means of preventing a recurrence of the complaint.

When the disease assumes the form of *lumbago*, and the pain is very severe, cupping from the part presents the most powerful remedy; which, together with opium and antimony, with or without a little calomel, will seldom fail to afford considerable and speedy relief. In less violent forms of the complaint, a blister or some warm or stimulating plaster to the part is often sufficient; and in still milder cases, friction, night and morning, for a quarter of

an hour, with any of the liniments and laudanum already mentioned, will often quickly afford relief. Whatever local treatment may be adopted, we are often called upon to administer opium at night, in order to procure repose. Should the opium cause constipation, it may be counteracted by laxatives, or we may give at the same time, for the purpose, the mixture of carbonate of magnesia, and sulphate of magnesia, with the wine, vinegar, or tincture of colchicum; which, besides maintaining an action on the bowels, probably has some share in affording relief to the patient's disorder.

In *sciatica*, the treatment ought to be conducted on precisely similar principles. Of course, should cupping or blistering be deemed advisable, the application must be made behind the great trochanter, in order to approach as near as possible to the seat of the disorder. Caustic issues, moxa, and even the actual cautery, have all been occasionally employed from the earliest periods. Both in lumbago and *sciatica*, acupuncture has not unfrequently afforded considerable or even complete, and, in some instances, instantaneous relief. When there is much torpor of the limbs affected with chronic rheumatism, electricity and galvanism are occasionally found of essential service in restoring activity to the superficial circulation, removing the stiffness and numbness, and giving tone to the muscles. Sparks should be taken at the origins of the nerves from the spine, and continued till a manifest irritation is produced on the skin; whilst a few slight shocks may be passed through the course of the nerves. When galvanism is preferred, the galvanic current may be made to pass also in the direction of the nerves of the affected limbs.

To guard against a relapse, the patient should be warmly clothed, whilst we endeavour to give tone to the system and to the limbs by the judicious application of cold or tepid bathing, and by the use of the flesh-brush.

GOUT—THE PODAGRA OF CULLEN.

Gout, in some respects, greatly resembles rheumatism; so much so, that the ancients failed to discriminate the two disorders, but treated of both under the general term *arthritis*; and even at the present day we are compelled to admit that they are not unfrequently associated together in the same individual, constituting a compound disease. By modern nosologists, the term gout is intended to express a great diversity of ailments, affecting either the system generally or particular parts of the body; all, however, apparently depending upon or connected with a similar peculiarity of constitution, all arising from the same causes, and moreover exceedingly liable to alternate with each other. It is the extreme diversity of character occasionally assumed by gout, which renders it extremely difficult to arrange distinctly and with exact precision all the varied, general and local, derangements referable to that morbid condition: nevertheless, we think that, upon the whole, the division of Dr. Cullen will be found to answer every useful practical purpose. He has divided gout into the *regular* and *irregular*; subdividing the latter into the *atonic*, the *retrocedent*, and the *misplaced*.

REGULAR GOUT.

The regular gout may be acute or it may be chronic. In its acute form it is characterised by pain, swelling, and bright redness suddenly affecting the joints of the feet or hands, but especially the ball of the great toe, and often accompanied by œdema of the surrounding parts; generally preceded by some unusual derangement of the stomach; followed by symptomatic fever; and at length going off with a gentle but universal perspiration, a more or less copious

sediment in the urine, and with itching and sometimes desquamation of the cuticle of the affected part; its frequent recurrence leading to great weakness, deformity, and distortion of the extremities, and occasionally to the formation of chalk-stones, either in or around the diseased joints, or in other parts of the body.

The above may be regarded as a very general definition of an attack of acute regular gout; but of course it is variously modified in different cases, and even in the same person at different times. It very commonly happens, that for some time previous to an attack, the individual suffers more or less from flatulency, acidity, pain or uneasiness at stomach; from eructations; or from feelings of anxiety, oppression, and lowness of spirits; or he probably experiences a sense of weight, coldness, numbness, or cramp in the limb about to be affected; with or without a remarkable fulness of the veins: it nevertheless frequently happens that he has no such warning, but is suddenly seized in the night, on awaking from sleep, with severe pain in the joint originally attacked, which, as already observed, is most commonly the ball of the great toe. It is indeed true, that in some instances the pain is moderate at first, somewhat resembling spasm or cramp, and thence leading the person to imagine that he has received a strain or hurt: in a majority of cases, however, the pain is loudly complained of from the beginning, and is compared by the patient to a gnawing, tearing, or laceration of the part; or he feels as if melted lead were poured upon it; whilst, from the extreme sensibility of the inflamed joint, the slightest touch or movement cannot be borne: indeed, this extreme sensibility and torturing pain constitute the most striking feature of an attack of gout; and serve in some measure to distinguish it from rheumatism, to which, as before stated, it is very closely allied.

It generally happens, that in about twenty-four hours, or towards the morning of the following day, the pain abates ; the abatement being usually attended with a gentle perspiration. The respite, however, is but transient, the pain for the most part returning in the evening, in some instances, with increased violence, and attended with bright redness, swelling, and such extreme sensibility of the part, that the patient feels and expresses the greatest alarm at the mere prospect of any thing approaching or touching it. With these symptoms, there is commonly more or less symptomatic fever, indicated by great restlessness, a quick and strong pulse, a hot and dry skin, thirst, a white tongue, some morbid change in the character of the urine ; and in some cases, by such disturbance of the brain as to amount to actual delirium ; the whole frame, both body and mind, manifesting in most instances a remarkable degree of susceptibility. In a short time the daily accessions of pain become gradually less and less severe ; and at length, perhaps at the end of a week, ten days, or a fortnight, cease to return ; the redness and swelling subside ; the cuticle perhaps desquamates ; the perspiration is secreted more freely and universally ; the urine probably deposits a more copious sediment ; the surrounding œdema disappears ; and the patient not only becomes suddenly convalescent, but very often, especially if it be a first attack, experiences afterwards a degree of alacrity, both of body and mind, to which he was formerly a stranger : or, what is not less remarkable or less common, some inconvenience or discomfort, connected with pain or uneasiness in some part of the body, which had annoyed him previous to the attack, entirely vanishes, leaving him with at least renovated spirits, if not with an actual increase of bodily vigour.

The above may be regarded as a general description of what usually takes place in an attack of acute regular gout :

the disorder is nevertheless subject to divers modifications: it may or may not be preceded by a certain number of the premonitory symptoms already noticed:—it may or may not, in its progress, be accompanied by sudden, transient, and intensely painful cramps or spasms, or neuralgic pains of the legs, thighs, feet, hands, ribs, or diaphragm: instead of attacking the ball of the great toe, the disease, even although it be a first attack, may originally fix upon the top of the foot, the heel, the instep, the back of the hand, the wrist, the elbow, the knee, the shoulder, or even the hip; or it may attack several of these parts simultaneously, or in succession; the degree of redness, pain, swelling and œdema, varying in each case according to the structure and situation of the individual joint and its appendages, according to the laxity or firmness of the surrounding tissues, and according to the extent and degree to which the bursæ or tendinous sheaths happen to be implicated: and lastly, the disease may continue a few days, or as many weeks; after which, in either case, it may entirely and completely disappear, or it may pass into the chronic form of the complaint.

After a first attack of acute regular gout, it very frequently happens that the individual remains altogether free from any recurrence of the complaint for a considerable period, the length of the interval, however, depending very much upon his own prudence and attention to prophylactic measures. It is possible that he may never experience any return whatever, or years may elapse before this happens; it is not unusual, however, for the disorder to return, probably about the same period of the following year, that period being most commonly mid-winter, or early in spring. After frequent repetition in this way, the attacks become gradually more and more irregular, both as regards the character and progress of the symptoms, and the period and

frequency of recurrence : the symptoms become less and less severe as the strength is exhausted by repeated attacks ; but in a corresponding proportion the attacks themselves are observed to be more frequent and protracted, so that the person shall have two or three attacks in the course of a single year, or he shall have one attack so prolonged as at length scarcely to be entirely free from the disease, except perhaps during two or three of the warmest months of summer. It is in such cases that the powers of the constitution generally, and the tone of the digestive organs in particular, are often greatly and permanently impaired ; and it is in such cases that the weakness and deformity of the limbs occasionally become extreme : for the disorder, under these circumstances, does not confine itself to the smaller joints, but extends to the ankles, knees, wrists and elbows, attacking several of these parts at the same time or in succession, and often giving rise to considerable œdema, especially of the lower limbs. Such a state of things constitutes what has been called *chronic gout*. In some rare instances, however, and especially in persons of a feeble or relaxed habit of body, the disease assumes a good deal of the character of chronic gout from the very first, as if the constitutional powers were inadequate to the development of the more acute form of the complaint.

After repeated attacks of acute or chronic gout, but sometimes at a comparatively early, and at other times at a late period, a peculiar deposit is observed not unfrequently to take place in the neighbourhood of the part affected, occasioning, in some instances, considerable enlargement and deformity ; interfering very materially with the mobility of the joint ; and more rarely, by the irritation they produce leading to ulcerations of the cartilages, and consequent ankylosis. This deposit is generally known by the name of *chalk-stone*, and consists of lithic acid in combination with soda. It appears to be originally in a fluid

state, and may sometimes be squeezed out from the part containing it, like so much semi-fluid plaster of Paris; it, however, soon acquires considerable, and in some cases even a stony, hardness. It may be deposited within the joint, or in any of the surrounding tissues, even to the cuticle; neither is such deposit limited to parts affected with gouty inflammation; it is sometimes met with in the integuments of the fingers, or of the face; apparently in the cartilages of the ears and fascia of the thigh, and not unfrequently in the integuments of the scrotum.

IRREGULAR GOUT.

Dr. Cullen, in employing the term *regular*, as applied to gout, made it have reference chiefly to the uniform presence of inflammation in one or more of the joints in that form of the complaint; whereas, in *irregular* gout, the affection of the joints may or may not be present. The varieties of *irregular gout* are the three following: 1. *atonic gout*; 2. *retrocedent gout*; 3. *misplaced gout*.

Atonic gout.—The symptoms which characterise this form of irregular gout, although occasionally inflammatory, are chiefly such as appear to result from nervous or functional disturbance of the parts or organs affected; these being, most frequently, the stomach, bowels, heart, brain, or kidneys. They are regarded as being of gouty origin, because they occur in a person who is known or supposed to be of a decidedly gouty habit of body, or who has actually suffered from a previous attack of gout;—because they are not unfrequently observed to alternate with, or to be accompanied by, slight and transient pains in the joints or other parts of the body usually affected by gout;—and because they are often observed to subside or disappear somewhat suddenly, on the supervention of a more or less perfectly developed fit of regular gout. The most common

symptoms of atonic gout are, an impaired appetite and bad digestion; a sense of fulness or distention after meals; acid or acrid eructations; uneasiness, or intense pain and spasm of the stomach, with nausea, and occasionally vomiting; a most distressing feeling of hollowness or sinking; violent palpitations, or other disturbance of the heart; remarkable anxiety and lowness of spirits; crampy pains in the trunk or extremities; morbid irritability, and great watchfulness; costiveness or purging, with symptoms of violent colic; pain, giddiness, or swimming in the head; symptoms of paralysis or apoplexy; oppressed respiration; pain in the regions of the kidneys or bladder, with strangury, or painful micturition; and in some instances, a mucous or puriform discharge from the urethra. A greater or less number of the above symptoms occurring under the circumstances mentioned, constitute atonic gout. As already observed, they are symptoms chiefly indicative of merely nervous or functional disorder of the parts or organs affected; it must nevertheless be carefully borne in mind in practice, that they may be, and undoubtedly occasionally are, mixed up with a certain degree of more decided inflammatory action.

Retrocedent gout.—When in a person already suffering from a more or less perfectly developed attack of regular gout, the external local affection suddenly ceases, and is immediately succeeded by derangement of some internal organ, the disease constitutes that form of irregular gout distinguished by the term *retrocedent*. The internal derangement in this case may take place in the stomach, the bowels, the brain, or indeed in almost any of the parts or organs already mentioned under the head of atonic gout; and the derangement itself may present a precisely similar character, being most frequently of the nervous or spasmodic kind; and in a large majority of instances affecting ei-

ther the stomach or the bowels; the former with severe pain and spasm, sickness and vomiting; the latter with symptoms of violent colic. The internal affection, nevertheless, may occasionally, as in atonic gout, partake more or less of an inflammatory nature, or the spasmodic and inflammatory conditions may be blended in various degrees in the same case.

Misplaced gout.—Gouty persons have now and then been observed to become the subjects of inflammation of an internal part or organ, which has suddenly subsided on the development of the external and ordinary form of gout. In other instances, persons suffering from external gout have had the external disease suddenly subside and disappear, and have been immediately seized with inflammation of an internal part. To these forms of disease the term *misplaced gout* has been applied.

CAUSES OF GOUT.

Predisposing causes.—One of the most powerful and most frequent predisposing causes of gout is original constitution; a state of constitution, in a majority of cases, manifestly hereditary. It is not, however, to be understood that every child born of gouty parents shall necessarily have the gout; on the contrary, many such children entirely escape it; or one generation shall escape, whilst the next succeeding shall suffer. A state of constitution also predisposing to gout, is not unfrequently acquired by peculiar habits and mode of living: thus it is a matter of notoriety, that the rich are more prone to gout than the poor; and especially that portion of the rich who lead an inactive and sedentary life, who indulge in the luxuries of the table, and who injure the tone of the stomach by repletion and the free use of wine. Spirit-drinkers suffer

less from gout than from derangement of the liver, and consequent dropsy; but those who consume large quantities of malt liquor, even amongst the poor, are by no means unfrequently the subjects of gout: in short, that form of indulgence in drinking which most certainly produces plethora, and at the same time destroys the energy of the digestive organs, most powerfully predisposes to gout. It has been remarked that the gouty disposition is often indicated by a large head, and a bulky and lax frame of body, but coupled, nevertheless, with a hale and robust state of constitution: there are, however, innumerable exceptions to this; many individuals with a pale and delicate skin and sandy hair, and even of very slender make, being great sufferers from gout. Men are more frequently affected with gout than women, whilst it does not in general appear in either sex before the middle periods of life: to this, however, there are also many exceptions; and in some extremely rare instances, even infants and children have been known to suffer: in the latter case it is probable that the hereditary predisposition must have been very strong.

When a predisposition exists, whether natural or acquired, very slight *exciting causes* are often sufficient to bring the disease into action, and especially so after one or more previous attacks. The most common of the exciting causes are, an occasional excess in the luxuries of the table, and especially a free indulgence in the more acescent wines; sudden vicissitudes of temperature, whether from a variable climate, a variable season, or actual exposure to cold; sprains, or other mechanical injuries; strong passions of the mind; great anxiety; intense application to study or business; excess in vengry; a sudden change from high to low living; bodily fatigue, or any other cause of debility and exhaustion.

Diagnosis.—When inflammation is limited to a single

joint, there will seldom be much difficulty in determining whether or not it is the result of mechanical injury; and it is extremely improbable, that ordinary idiopathic inflammation of a part, independent of any gouty disposition, should mislead us. The history of the case, the age and aspect of the patient, the situation and appearance of the part, and the character of the pain, will pretty uniformly remove any doubt that may have existed on the subject. The only disease with which regular gout is likely to be confounded, is rheumatism, and especially that form of rheumatism described under the name of *rheumatagra*, or *rheumatic gout*. The means of distinguishing the one disease from the other has already been pointed out under the article *Rheumatism*; and it is satisfactory to learn that, when any difficulty occurs, the diagnosis is of very little practical importance, as nearly the same treatment is applicable to the one case as to the other.

When from some peculiar state of the system, from injudicious treatment, or from repeated attacks, the gout assumes an irregular form, it often gives rise to symptoms of a most varied character, and such as may very readily be mistaken for original or idiopathic disease of the part or organs which happen to be assailed by the gouty disorder. These internal gouty disorders vary not only according to the part or organ which happens to be assailed, but moreover according to the particular form which the disorder itself happens to assume;—whether it be nervous or inflammatory, or various degrees and proportions of these two states combined. In this way an inflammatory action may be set up in the brain resembling ordinary phrenitis; or it may take place in the stomach, the bowels, or the lungs; or, on the other hand, without any indication whatever of inflammatory action, the stomach may be the seat of intense pain and spasm, probably with sickness or vo-

miting; or the patient shall be seized with violent pain in the bowels; or he shall experience a most distressing sense of sinking and faintness; or his heart shall be affected with palpitation, or his brain with delirium; or he shall have an attack of palsy or apoplexy. In these irregular forms of gout, or, perhaps more correctly speaking, in these anomalous derangements occurring in a gouty habit, our diagnosis must be guided by a careful inquiry into the hereditary tendencies of the patient or the patient's family, by the history of the individual case, and by the peculiarity, incongruity, and, in many instances, even by the very intensity of the symptoms; whilst the nervous or inflammatory nature of the disorder must be determined by the absence or presence of febrile symptoms; and if the part be accessible, by the degree of pain on making firm and steady pressure.

Prognosis.—The prognosis in gout is twofold,—as it regards immediate danger, and as it regards a permanent and perfect cure. It may pretty confidently be asserted that regular gout is of itself nearly or altogether free from danger: it is only, therefore, in cases of metastasis, or when the disease assumes some of its irregular forms, that any serious apprehension need to be entertained as to the result. When, however, the stomach is seized with symptoms of extreme debility, pain, or spasm, as indicated by a sense of sinking, coldness, and faintness, eructations and flatulent distention, or by exquisite pain in that organ; or when that or any other important organ of the body is affected with acute inflammation; or when the bowels are affected with excruciating symptoms of colic, or the heart with violent palpitations; or when the brain is so involved as to produce delirium, or symptoms of phrenitis, palsy, or apoplexy; and especially when any or several of these derangements occur in old persons, or

in those whose constitutions have been broken down by repeated attacks of gout, or by dissipation or debauchery;—our prognosis ought to be very guarded,—is perhaps at all times unfavourable, and often positively hopeless. As to a permanent and perfect cure, it is hardly to be expected even in regular gout; it is nevertheless more improbable than impracticable; for few persons can so far master their sensual appetites, and realize self-denial, as to submit to the ordeal necessary to eradicate the natural or acquired tendency to the disorder. But that this may be, and occasionally has been, accomplished, is not to be disputed. Our prospect of success, however, will depend not only upon the resolution and forbearance of our patient, but also, in some measure, upon the particular state or condition of his constitution at the time; for if it have not been materially impaired by dissipation, by luxury, or by repeated attacks of the disorder, we may reasonably entertain a hope, that by temperance, both as regards eating and drinking, moderate but regular exercise, tranquillity of mind, and proper rest and recreation, he may at least greatly diminish the frequency and severity of his attack, if not entirely and permanently eradicate the complaint. If, however, the patient be advanced in years; if the tone of the digestive organs have been very much impaired; if the constitutional strength be exhausted; and if the disease have assumed the chronic form; not only is such a result not to be expected, but the means recommended to effect the desired purpose, under ordinary circumstances, may only tend to do harm, and even place the patient's life in danger. In such aggravated cases, therefore, occurring in the aged and infirm, the best we can hope for, in many instances, is to mitigate suffering, and, by supporting the strength of the patient, enable him to bear up against the repeated attacks of a then incurable disorder.

It has been said that a fit of regular gout often has the effect of removing other complaints; and it is an opinion apparently founded on correct observation. It has already been observed, that there exists an intimate connection between the ordinary phenomena of gout and a deranged condition of the digestive organs,—gouty subjects being almost proverbially dyspeptic. This disturbance of the digestive apparatus is variously modified in different individuals; the most usual symptoms being flatulency, acidity, eructations, and occasionally nausea or pain at stomach, or feelings of anxiety and depression of spirits. Some of these symptoms very often precede, for a longer or shorter period, the attack of regular gout; immediately after which, many, and sometimes all of them, are observed entirely to disappear, or at least to be very greatly mitigated: and whether we regard them as distinct from gout, or as forming a mere part of that disorder; the fact of their being mitigated or removed is equally indisputable. But not only do these very common precursors of the disorder, as well as certain uneasy or unusual feelings in the limb about to be affected, diminish or disappear for a time after a fit of regular gout, but there are many other derangements and indescribable feelings occurring in different parts of the body, which sometimes speedily vanish on the supervention of regular gout. These anomalous derangements may affect the stomach, the bowels, the heart, the brain, the bladder, or the kidneys. It is true that they have rather been regarded as irregular forms of gout, than as distinct and independent diseases, merely occurring in a gouty habit; they nevertheless serve to establish the fact, that various disorders, sometimes of long standing, are now and then relieved or entirely removed by an attack of regular gout. In illustration it may be observed, that we knew an individual, who, after suffering repeatedly from gout, became

the subject of epilepsy: this continued to assail him from time to time for several years, but without any return of gout. At length he experienced an attack of regular gout, after which his epilepsy never returned during the two years he remained under our observation.

TREATMENT OF GOUT.

Before proceeding to the consideration of the treatment of gout, it may be well to impress upon the mind of the student, that an attack of acute regular gout may be said to be altogether free from danger, and in some instances even proves highly salutary in its consequences; that chronic gout is a stubborn, very intractable, and distressing form of the disorder; whilst the irregular forms of the complaint are at all times alarming, and frequently attended with extreme peril to the life of the patient. Remembering this, the student will endeavour, as far as possible, to abstain from such remedies as are calculated either directly or indirectly to favour the production of either chronic or irregular gout. Of equivocal remedies of this kind, it may be asserted generally that they are for the most part, 1st, such as are calculated greatly to impair the tone of the system at large, or of the digestive organs in particular; 2ndly, such as have been employed empirically, merely to obviate or remove an individual attack without any attempt being made either to correct the state of the system, which leads to or proves a consequence of gout, or to regulate the diet and habits of the patient; and 3rdly, such as have a tendency to put a sudden check to the local inflammation.

The treatment of gout may be divided into that which ought to be pursued during the actual attack; and that to be adopted in the interval.

Treatment of a fit of regular gout.—Although the general history of gout would lead us to expect, and experience

proves, that most persons, when assailed by regular gout, and especially for the first time, will be found in a state of plethora, or fulness of habit, it is not less a matter of correct observation, that such persons, whether of large and apparently robust frame, or of more delicate and slender make, very commonly display at the same time a considerable want of constitutional, or, what may be called nervous tone, which unfits them for bearing with impunity such active measures as are calculated greatly to reduce the general strength. On the contrary, without questioning the occasional, or indeed frequent, existence of more or less general plethora and local congestion, it will be much more uniformly found that such gouty subjects present well-marked indications of a very deranged condition of the digestive organs, coupled with a remarkable degree of morbid susceptibility, or other morbid state of the general nervous system, as shown not only in the numbness, sense of weight, cramps, and intense pain of the external local affection, but in the extraordinary sensitiveness, both of body and mind, which such patients evince during the continuance of the paroxysm.

From all this it would appear that the principal indications are, 1st, to subdue febrile excitement, lessen plethora, and remove local congestion, with as little loss of power as possible; 2ndly, to correct the state of the digestive organs; and 3rdly, to allay the general irritation and local pain.

When the patient is of moderate age; when he is manifestly of a full habit of body; and especially when the febrile excitement is considerable; doubtless moderate general blood-letting is admissible, and may prove more or less beneficial: nevertheless, the general excitement and distress are so intimately connected with the peculiar condition of the system at large, and of the *primæ viæ* in particular,

that blood-letting is not found by any means so efficient as in ordinary phlegmasiæ; whilst, on the other hand, it is amenable to the objection when too freely employed, of impairing the general powers of the system, and thereby favouring the production of chronic gout. General depletion, therefore, even to a moderate extent, is not very often recommended. Should any obvious tenderness exist at the scrobiculus cordis, or in either hypochondrium, the application of cupping-glasses or leeches may be desirable and proper: such a practice, however, is seldom deemed expedient; and before having recourse to it, it will be well to premise remedies calculated to remove irritating matters contained in the primæ viæ, and which may be leading to a mistaken belief in the existence of congestion or inflammation. The remedies alluded to are purgatives, which in every case constitute a most important, most efficient, and indeed almost an indispensable part of the treatment. It is best to begin by administering a brisk purge, in order effectually to clear out the bowels; for this purpose, 10 or 12 grains of compound extract of colocynth, with 3 or 4 of calomel, or 5 or 6 of blue pill; or 4 or 5 of calomel, with 15 grains or a scruple of rhubarb; or 4 or 5 grains of calomel, followed in a few hours by the senna and salts; are amongst the most eligible. Having in this way effectually cleared the bowels of their vitiated contents, we must continue to maintain a free discharge, and at the same time endeavour to improve the character of the secretions by repeating the laxatives, and by a cautious and moderate use of mercury, either given alone or variously combined, according to the circumstances of the case. Upon the whole, however, the practice which we have found most efficient and successful at this period, is such a combination of laxatives, alteratives, and anodynes, as is calculated to fulfil at the same time the two indications, of correcting

the state of the *primæ viæ*, and allaying the general irritation and local pain. For this purpose, about 10 grains of carbonate of magnesia, with from half a drachm to a drachm of the sulphate, may be given in any agreeable vehicle, with or without from 20 to 30 minims of the *vin. or tinct. colchici*, twice or thrice a day. With a further view of allaying irritation and pain, correcting the secretions, and promoting perspiration, about a grain of opium may be given with a quarter of a grain of tartar emetic, or 2 or 3 grains of Dr. James's powder, and half a grain or a grain of calomel, in the form of pill, every night and morning. In this way the laxative mixture not only cooperates with the pills in fulfilling important indications, but at the same time has the desirable effect of counteracting the inconveniences which would otherwise result from the constipation so often produced by opiates in general. Of course various modifications of treatment will arise out of the peculiarities of the case, or idiosyncracies of the individual: sometimes the wine or tincture of colchicum may be advantageously given in the liquor ammon. acet. mixture, with the liquor opii sedativus, in doses of from 15 to 20 minims of the latter, or with the acetate or hydrochlorate of morphia, in doses of from a quarter to half a grain, or more; interposing, in such cases, a laxative of the mercurial kind only occasionally. Some persons derive much relief from 5 or 10 grains of Dover's powder twice or thrice a day, either alone or with 2 or 3 grains of *hyd. c̄ cretâ*, or blue pill; others, again, are greatly benefited by the use of the extract of colchicum; whilst others cannot bear colchicum in any form, in consequence of its offending the stomach. It need only to be observed further on this part of the subject, that all violent purging ought to be avoided, as it greatly weakens the patient, and leaves behind a strong tendency to the chronic or to the irregular forms of the disorder. As the

case advances, therefore, the more active purges, as well as the mercurials, may give place to the occasional use of such mild laxatives as magnesia and rhubarb; the latter and sulphate of potash; or castor oil; substituting for the purgative mixture some mild diaphoretic, with or without colchicum, and an opiate; or the effervescing mixture, with excess of alkali, may be given during the day, with the opiate every night or every night and morning. The stramonium, as well as the milder anodynes, conium, hyoscyamus, and lettuce, have all been tried, but are of much more equivocal efficacy than those mentioned.

Of course the patient should be confined to slops and to the lightest food during the whole continuance of the paroxysm, and very slowly return to the most temperate living as the attack declines. He ought also to be deeply impressed with the fact, that any excess in eating or drinking, and any exposure to damp and cold during the continuance of the disorder, may suddenly give rise to a metastasis, which shall place his life in danger.

Local treatment.—As a general rule, the less we meddle with the local affection the better. Lecches, poultices, the vapour baths, hot pediluvia, soap plaster, flannel, fleecy hosiery, and even plunging the extremity into cold water, have all been recommended and put in practice. Of these, however, some, from their weight or irritation, cannot be borne by every patient; some fail to afford relief; some are pretty uniformly injurious; whilst others are actually hazardous to life; for not only are they liable to occasion a transition of the gouty inflammation to another joint, but have been known to lead to fatal consequences, by causing metastasis to an internal organ.

If the weight of the bed-clothes, or heat of the bed, prove distressing, the bed-clothes, if practicable, may be removed from the affected part, and the latter lightly covered with

a silk or cambrie handkerchief. At the present time, however, the most approved practice consists in the assiduous application of a tepid spirituous lotion. This is directed to be made in the proportion of one part of alcohol, and three or four camphor mixture, and applied at a temperature of from 75° to 85° of Fahr., through the medium of several folds or strips of fine linen. This has been found to afford considerable relief, and to be free from all risk. In this case, also, the bed-clothes may occasionally be removed, and the parts loosely covered with a handkerchief; or a cradle may be placed over the limb beneath the bed-clothes.

When regular gout passes into a more lingering and *chronic* form, the treatment ought to be conducted on principles precisely similar to those just laid down; due regard being had to the age, remaining strength, and general condition of the patient, and to the degree of activity displayed by the disorder itself at any particular time. Of course, the remedies, though much the same in kind, must be moderate in degree, according to the conditions just stated; the principal points to be attended to, being, relief from pain, the procuring of repose at night, correcting the state of the stomach and bowels, and proper regulation of the diet of the patient, both as regards the quality and quantity of his food and drink.

It is chiefly in the more chronic forms of gout that various other remedies than those mentioned have been at various times recommended; such as the Duke of Portland's powder, guaiacum, mustard-seed, ginger, eajuput oil, sulphur, conium, and duleamara. Certain reputed specifics, however, have been largely exhibited in even the most acute cases, either with a view to prevent the full development of the disorder, or quickly to cut it short. Of these, the most celebrated are, the eau médicinale, the colchicum,

the tincture of white hellebore, Wilson's tincture, and Reynolds's specific. All these have undoubtedly been, in turn, more or less successful; but when the disease is treated exclusively by them, or nearly so, and without making proper attempts to correct the general state of the patient, and regulate his habits, very serious, and sometimes fatal consequences are apt to ensue, from internal organs becoming affected. As palliatives, therefore, both in acute and chronic gout, they may prove valuable and safe; but as exclusive remedies, they ought to be condemned as hazardous, if not positively pernicious.

Treatment of irregular gout.—The irregular forms of gout most frequently result from improper, but especially, cold applications made to the affected joints; from irregularities of diet, or from partial or general exposure to damp and cold. They may occur in the progress of acute or of chronic gout, or they may take place in gouty subjects, in the absence of both; they are usually most severe when they occur in the progress of acute gout; they are less so in chronic gout; whereas, in the absence of both forms of gout, they are exceedingly variable both in their intensity, seat, and duration. But under whatever circumstances they may make their attack; whether they affect the stomach, the bowels, the brain, or any other part of the body; and whether they consist in inflammation, or spasm, or a combination of these two states, the student cannot be too careful to bear in mind, that when they are once developed, they are to be treated precisely in the same manner as corresponding disorders originally or idiopathically affecting the same organs: the only peculiarity consisting in an endeavour, if possible, to restore the gouty inflammation in the joint in which the disease had previously existed, or in which the patient experiences slight and fugitive pains, by the applications presently to be mentioned. The most common

form of irregular gout consists in violent pain and spasm of the stomach, with or without sickness. The distress of the patient is often extreme, the danger is imminent, and the most active measures must immediately be adopted. When satisfied, therefore, from the absence of fever, the effects of pressure, and the character, and even the intensity of the pain, that the disorder does not depend upon inflammation, we must administer freely the most powerful stimulants and anodynes. A good supply of brandy has often succeeded; but, as a medicine, a combination of ether and laudanum will be found the most efficient. Half a drachm or a drachm of rectified ether, with the same quantity of laudanum, may be given in a glass of camphor mixture, and repeated in from ten minutes to half an hour, if required; and, indeed, as often and at such intervals as the urgency of the case shall appear to demand. At the same time, the patient may be placed in a warm bath; or he may have hot fomentations or hot poultices, with or without mustard, applied to the pit of the stomach. When the bowels are the seat of severe pain and spasm, a corresponding practice may be adopted in the first instance; to be followed by 5 or 6 grains of calomel, and a grain or two of opium; and this again by a dose of senna and salts, or by purgatives and glysters, or both, in the course of a few hours, with a view to unload the bowels of their contents.

In proportion as the affections of the stomach and bowels give us reason to apprehend an admixture or preponderance of inflammatory action, in the same proportion must stimulants and opiates be administered with caution and reserve; and in the same proportion will it be proper to adopt general and local depletion, and other antiphlogistic measures.

When the patient is seized with violent nervous palpitation and sense of sinking, the stimulating practice just men-

tioned may be adopted with caution; and, as regards the head; symptoms of phrenitis, apoplexy, or palsy, must be treated on common principles. In less violent nervous attacks, the musk, camphor, and other reputed antispasmodics, may occasionally be tried.

The remedies usually recommended to excite or reproduce the gout in the joint, are, hot pediluvia, mustard poultices, or even blisters.

Treatment during the interval.—The object here is twofold; to remove the effects left behind by a previous attack; and to prevent a recurrence of the disorder by a proper regulation of the diet and habits of the individual.

After an attack of acute gout, the weakness of the limb, and tendency to œdema, may often be very materially benefited by frictions, either with the hand or a soft flesh-brush; and by a well-adjusted bandage of calico. When the large joints are affected, they, as well as the bursæ mucosæ, and sheaths of the tendons, often remain for some time considerably swollen. Here, also, friction may be employed with or without some slightly stimulating and anodyne liniment, such as the lin. ammon., the lin. sapon. co., or lin. camphor. co.; to each ounce of either of which, a couple of drachms of tinct. opii may be advantageously added, especially if there be any pain or tenderness remaining. In other cases, a blister to the neighbourhood of the swollen structure will sometimes greatly accelerate the recovery of the part; whilst in others, the use of the warm bath, or of the tepid bath as found at Buxton, or of dry pumping, will be found of service.

Although some persons are so prone to gout, that no prudence or precaution, however rigidly adhered to, will preserve them entirely from returns of the disorder; still, even in such instances, much may be done, by a proper regulation of diet and regimen, to lessen the frequency and

violence of the attacks ; whilst in others, similar prophylactic measures may succeed completely in warding off the complaint.

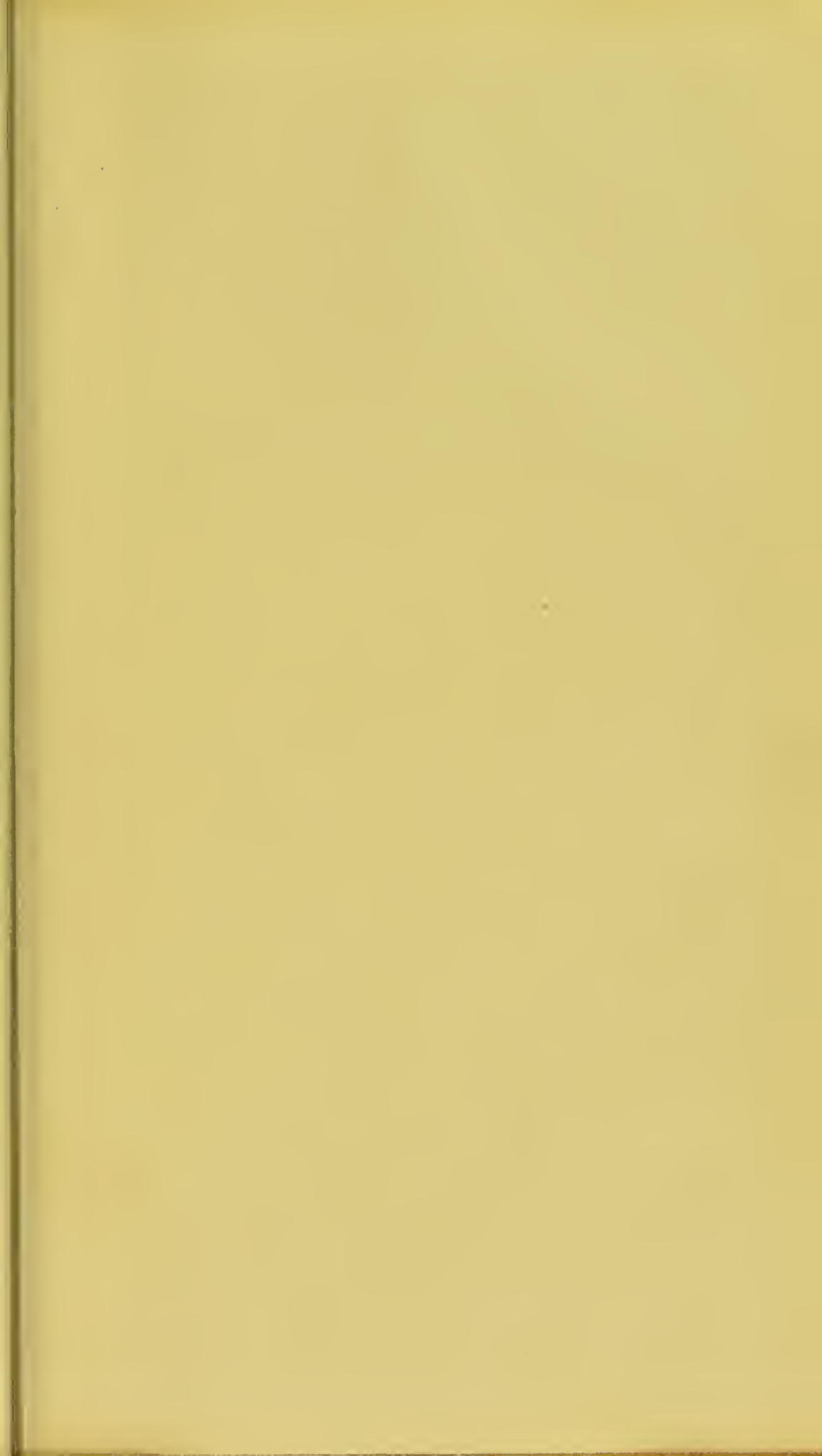
The gouty person should be exceedingly temperate both in eating and drinking : he ought to be very moderate in the use of animal food ; avoid all rich, highly-seasoned, and made dishes ; and only partake of plainly-dressed meat once a day. He ought not to indulge in malt liquor : he must be moderate in the use of wine, if his previous habits or the state of his constitution render it impossible or very inconvenient to dispense with it entirely : he should abstain from the lighter acescent wines, and substitute good old port ; or, what is perhaps better, sherry. Spirits are at all times bad ; and are only admissible when the patient is very old, or the powers of the constitution are greatly impaired. He should be regular in his exercise and rest : horse exercise in particular is desirable : he should avoid excessive fatigue, and all close application to business or study ; and, in short, whatever is calculated to enervate his frame, or impair the tone of his digestive organs.

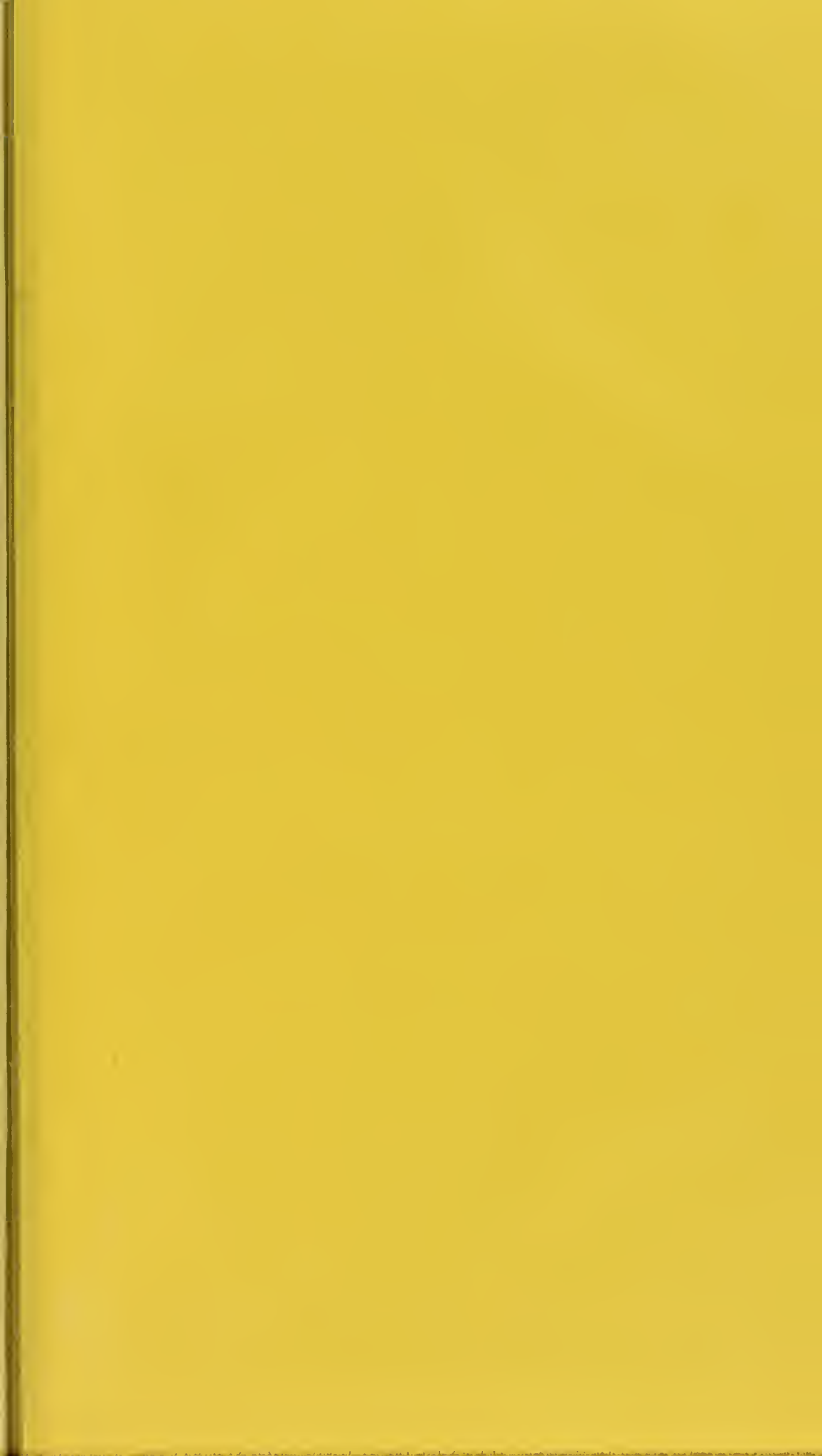
Whilst the patient carefully observes these general rules, we may endeavour to improve his condition by the occasional use of mild laxatives ; by exhibiting now and then a mild mercurial alterative ; and by the employment of some gentle bitter, with or without a little of some of the preparations of soda, potash, or magnesia. The laxatives, as well as the tonics, may be rendered more or less warm or stimulating, by the addition of the purgative or aromatic tinctures, according to the age and remaining constitutional powers of the patient.

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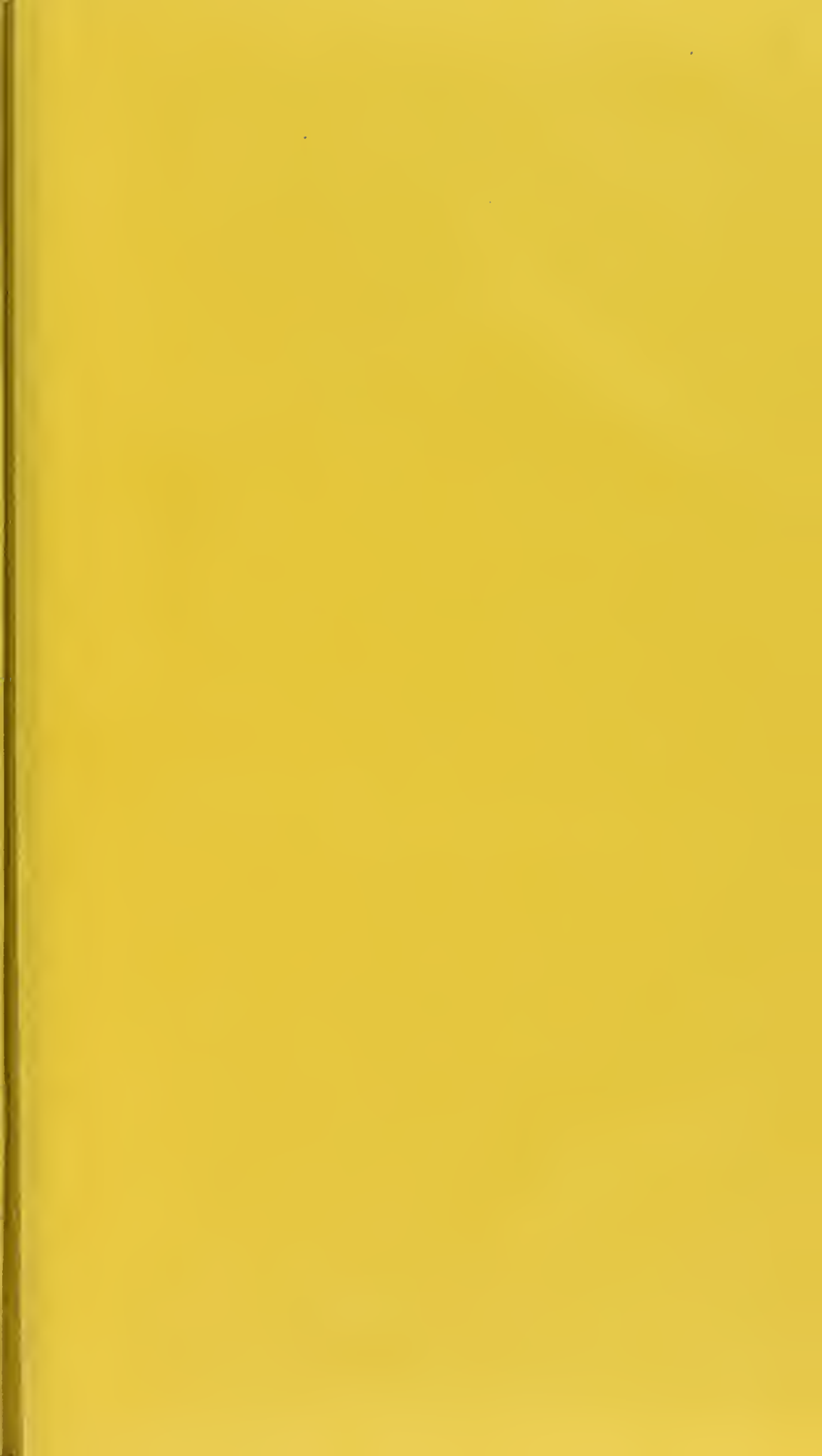
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